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GAS JOURNAL

LIGHT • HEAT • POWER • BYE-PRODUCTS

[Founded in 1849 as the "Journal of Gas Lighting."]

VOL. CLIV. No. 3028.] LONDON, MAY 25, 1921. [73RD YEAR. PRICE 1s.

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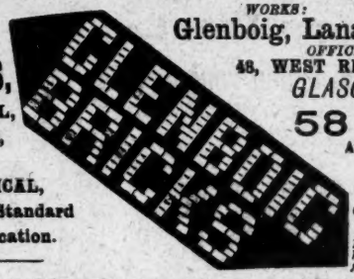

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EDITOR & PUBLISHER: WALTER KING. OFFICE: 11, BOLT COURT, FLEET ST., LONDON, E.C. 4.

VOL. CLIV., No. 3028.] WEDNESDAY, MAY 25, 1921. [73RD YEAR.

EDITORIAL NOTES.

The Coal Strike and a New Atmosphere.

THE country was favoured last week with sunny days and much more cheering weather. The newspapers were also full of hope-inspiring messages regarding the coal strike, over which people generally continued to display a very philosophic demeanour. They are getting accustomed to strikes, which do not perturb them nearly so much as they did when they were less frequent. The great spectacular display of the Miners' Federation, and the "splendid "gesture" of the Transport Workers' Federation and the National Union of Railwaymen regarding imported coal, have faded considerably in public attractiveness; and these great unions and their constituents, instead of being any better off for the miners' massed attack upon the country, and the "side shows" of the other two Unions, are financially much worse off. The result is likely after all to be precisely what could have been obtained by constitutional and diplomatic procedure. Throughout the week there have been more or less vague hints that there were important movements in progress, and informal conversations were being freely but privately indulged in, with the view to arriving at an agreed basis on which negotiations could be resumed. But there was great reticence and caution over what was taking place in the matter of preparing the ground on which discussions could be revived. "Slow but sure "progress" sums up all the intelligence that could be obtained; but vague rumours were afloat that there is a good chance that what is now being done will result in a general wages agreement which will have lasting application. Now that the nation is "in the soup," it would rather remain there a little longer if the extended time will bring to it such a beneficent outcome.

There is one thing definite. The mine owners will not consider any scheme till the national pool is totally deleted as an essential condition to a settlement of the wages question. And about a national pool, there is less talk now among the miners' leaders. They are showing a more conciliatory attitude; and some of them are convinced that as a body they have been after something that is "beyond the "moon." They have been holding-out for the pool, and nothing but the pool. The miners at home have been talking of wages, and nothing but wages. The latter are anxious now to be earning decent wages rather than that their leaders should keep them in a state destitute of financial resources, because of a new principle which many men do not understand, and do not even care to try to understand. Most of the Miners' Unions are to-day heavily in debt. The debts, the miners know, have to be paid-off when work is resumed, and this will mean a heavy increase in subscriptions. In some districts the past week has seen no distribution of strike pay; in others the pay has been a mere pittance. In certain districts, there are no coupons. Is it to be wondered at that the men who are the hardest hit personally—and these are not the so-called leaders—are losing heart, though the leaders solemnly aver that the men were never more staunch than now? They may be loyal to their leaders; nevertheless they are losing heart. When leaders who are known for their militant spirit, and a vocabulary rich in expressions that have a stimulating effect on their constituents, are talking in calmer mood of doing everything possible to find a way out, we may look for a better issue from negotiations than there has been hitherto.

As to imported coal, it has been coming into the country in large quantities. There have been instances in which it has been temporarily held up; but only a few. On paper, and to the people whom they callously wished to deprive of fuel for public services, the Executives of the Transport Workers' Federation and the National Union of Railwaymen said they were satisfied with the effects of their embargo on the movement of coal imported or handled by "blackleg" labour. They were apparently easily pleased. On the other hand, the Government are also quite satisfied with what has been done in respect of coal from abroad. When the representatives of the nation are satisfied and the men who sought to injure the nation are also satisfied, then nothing more need be said on the matter. There was nothing done to tighten the embargo. Probably, in view of public opinion and the half-hearted response of the transport workers and railwaymen to the inhuman commands of their leaders, strategy exhausted itself. Regarding the distribution of imported coal, it was announced in the "Board of Trade "Journal" that arrangements had been made for this through four firms who were acting as Government agents, and who were to dispose of the coal only to consumers on a priority list. On the list, railways came first; and second, public utility undertakings—gas, electricity, water, and sewage. There followed domestic and household purposes (including public institutions). Factories and shops producing food succeeded; and paper-mills (producing for newspapers) and newspaper printing works found a place at the end. It is a pity buyers of the imported coal do not know more as to the total of the charges per ton they will have to pay for it before entering into an agreement to take a share in cargoes that are available. This manner of doing business—it may in the circumstances be unavoidable—is very awkward for those buyers who have to get possession of coal, utilize it, and sell their productions without any exact knowledge as to what the fuel cost is going to be. However, this is only a temporary matter; and the cost of satisfying present needs will have to be straightened-out subsequently. Anyway, imported coal is one of the important factors in the brightening of the situation.

Progress Obstructs the Extremists.

THE coal strike and the developments from it have been fruitful of lessons which should not be lost upon the country, upon trade unions, and upon the extremists who appear to have largely captured the helms of these organizations. In the first place, it is definitely clear that the country is in no mood, nor is it prepared, to allow "leaders" of trade unions to step outside their proper functions, and to utilize these organizations for political purposes. This is an important determination on the part of the community; but it is well to ascertain what has brought it about. Such determination is not only due to those who are not trade unionists, but is shared by a great many of those who are. And why? The answer is because higher education and training have enabled large numbers of the men to form better judgment and opinions on their own account than they were able to do previously; and the better their capacity for judgment, the less willing are they to have their opinions moulded by those ultraists whose thoughts and actions are purely revolutionary and reactionary.

These men, the present strike makes obvious, have not taken full account of the movements and developments that have taken place outside their own little world of action and their own circumscribed minds. Through the period of the coal strike, they have been failing all along the line. Nothing that has been done or attempted by them outside the question of the revision of wages—revision that is fair and in conformity with changed circumstances—has been

endorsed by the public. Every effort to hustle nationally-elected authority into making some political concession to the miners has found the community solidly at the back of the Government, and the community comprises a large proportion of trade unionists. Government has its functions; and a trade union its functions. Discrimination as to the legitimate functions of the one and the other is easier to the educated mind than to one whose mental capacity is restricted by the want of the education that sharpens and quickens intelligence. The extremists among the trade union leaders have overlooked this. They forget that they are not dealing with men in the rank-and-file of the unions who are on the level of understanding and knowledge of the workers of a past day, nor are they dealing with certain Russian types of workers. Ability to discriminate compasses right and wrong. Hence it is that the ban of the extremists on the importation and distribution of coal has proved a fiasco. The prohibition has not had the sympathy of large numbers of members of the Transport Workers' or the Railwaymen's Unions; and it certainly has not had the sympathy of many outside the ranks of these bodies. So it comes about that—through volunteers and trade unionists who know that it is a far greater sin to harm their country than to be disloyal to unionist leaders who conceived that harm—imported coal has been unloaded and distributed to public utility concerns, and the country has been saved from those things that would have been much worse than the personal inconveniences and industrial losses that are of the issues of the long drawn-out coal strike. Facts are far more impressive than words; and the facts show that other brains are operating in the industrial world than those of the extremist leaders. The working of these other brains will never permit of there being a solid following of industrial employees to revolutionary tactics. The directions of leaders must be right in the fullest sense of the word, or the workers of this country will never march to them as a single body. The transport workers and the railwaymen's leaders to-day realize the truth of this more than they ever did before. Facts have brought it home to them; and they know that the wild use of platitudinal phrases, illogical talk, and argument that does not compass the whole of the essential components of a situation or question, will not bring about a complete formation and solidarity in the ranks of the workers. Knowledge and common sense must be decadent and not ascendant before the extremists can hope for an unbroken backing from the workers of this country.

There has been a Triple Alliance; there are movements to the formation of larger Federations of Unions; there has been much talk of the internationalization of labour. There has been a collapse during the coal strike. Such things can be too unwieldy. The constituent parts may not be of a character that will cohere throughout the structure. Opinions differ. Individual judgment offers strong opposition to collective movement. Ask the leaders of the transport workers and the railwaymen whether this is not so. Ask the leaders of the Miners' Federation what are their innermost thoughts to-day on this subject. They are not likely to reply other than evasively. But we know as well as if they honestly revealed the truth.

There are other things that have grown gradually into effective factors in such situations, and which stand in the way to the full exercise of the methods of the extremists, and so prevent the latter becoming what they have striven hard to become, the dictators of national policy. This the nation will not tolerate, preferring to frame and pursue its own policy, and not that of a section of the community, unless completely endorsed by public opinion. Furthermore, the mechanism of our daily life, as a community and as an industrial and commercial nation, has greater working freedom to-day through the spread of skill and efficiency, and developments generally in the arts and sciences. The railwaymen and the transport workers know this. It was not long since that the extreme elements in the leadership of the unions had overlooked the fact that progress has brought into being a host of men who are skilled, and yet are not eligible for a trade union card. The last railway strike found capable volunteers for railroad work, and every day the strike lasted saw the train services of the country being bettered. Then, again, a large proportion of the population can drive mechanically propelled vehicles; and there is no lack of unskilled labour and qualified supervisors outside the Transport Workers' Federation. Conditions have altered, and in ways (both inside and outside the unions) that undermine the power of labour organization and federation other than for legitimate objects. The epithet "blackleg" may be applied by the extremists. Men who avert the suffering of privations by the men, women, and children of the country are patriots. Again, it has been proved that the country is not wholly dependent upon home-produced coal. Progress in the gas, electricity, and oil industries has brought about changes which help to minimize the misuse of the power of trade union organization. There was a strike at the Greenwich power station, owing to the unloading of imported coal. There was no lack of labour for the work; and an extract from a newspaper report speaks volumes: "How well every-" body has worked was evidenced on Monday [Bank Holi-" day], when an excellent holiday service of trams was run; " and the day's returns exceeded £19,000, which was said " to be a single day's record for the L.C.C. trams." Just as progress in skill supplied men who relieved the effects of the last railway strike, and men in great numbers who registered as willing to take duty in the event of a strike of transport workers, so progress has shown how to make the best use in times of emergency of fuels other than coal—coke, breeze, and fuel oil. Much steam-raising is being done to-day by these fuels instead of coal. The losses of the coal industry, including those of the men, have been and will be very material through the pernicious policy pursued by the Miners' Federation.

These are all considerations—facts that have been demonstrated—that should help the extremists in the labour world to take a more intelligent and enlarged view of things. They have hitherto failed to see how much their power has been limited by the developments of time. They have been too much obsessed by revolutionary ideals. Their energies should be devoted to legitimate work, and not to the pursuit of projects that are opposed by progress in the capacity of the industrial worker for individual determination, in the skill of men, and in applications and methods that advance the conveniences, and so ameliorate the conditions, of our daily life.

Negligence a Factor in Legal Competition.

Is lighting worth keeping? asked, in last week's "Journal," Mr. W. J. Sandeman, the Distributing Engineer and Sales Manager of the Croydon Gas Company. The same question has been put in America; and those gas men in every country who have seriously considered it reply, "Of course " it is." Those who have not seriously considered the question are the biggest enemies of their own interests and of the undertakings they serve. And these are the gas men who are giving some electrical men the idea that the gas industry has come to the conclusion that "the game is up" so far as lighting is concerned. There are electrical men who have been good at deception. In this matter, if they really believe that gas lighting is not a powerful competitor, they are deceiving themselves.

It is our deliberate view that gas negligence has in various directions as much to do with successes of electric lighting in competition as have any of the merits of the latter. In too many places, the lighting business is left to look after itself, as though it is of no importance; while, as a matter of fact, it is of the highest material value in the trading system of the industry. We have heard a gas engineer say that the taking during six months of a daylight hour out of the sleeping hours, and adding it to those of our daily activities, has made a distinct difference to the value of the lighting business, and that it is better to devote time and energy to the cultivating of the heating branch of the business, as gas-fires are more robust consumers than gas-lamps. This same engineer looks, with a smile upon his face, at the loss of much lighting business, because his winter consumption has grown tremendously through his devotion to the task of cultivating domestic heating. Gas engineers and managers who hold such views, and who neglect lighting, and so allow electricity to have a walk-over, are men who do not thoroughly appreciate the value of the diversity of trade and demand upon the efficiency and stability of a gas undertaking. The degree of the demand for gas for heating depends upon uncontrollable atmospherical conditions; and these are fickle. They are, at any rate, very distant from the constancy of the hours of darkness, and the demand for artificial light. Lighting runs on, too, during hours when cooking has largely ceased, and the industrial load has practically ended, for the day. Lighting has a membership and a place in the industry's business which must not be neglected. Those who are

negligent of it, those who have arrived at the conclusion that gas lighting is suffering from unavoidable atrophy, are making a mistake they will ever regret if it is allowed to continue.

In Croydon, Mr. Sandeman and his staff experience keen electrical competition. Electrical competitors there will agree that the competitive activity is not all on their own side. The facts of a six months' record given in the letter from Mr. Sandeman last week show that the gas-lighting business in the Croydon area of supply is being maintained, and is adding flesh. An active maintenance department, show-rooms, systematic exploration for new business, and persistent assaults upon obsolete lighting installations are effective from the gas company's point of view, and somewhat distressing from that of the electrical competitors. All such work is best done with a commercial or utility specialist at the head—not a man who calls himself a specialist, but whose technical knowledge and commercial ability are of an order that refuse to substantiate the claim. A lighting specialist is not a mere seller of lamps; his qualifications extend to and over the science of illumination. The science of illumination provides him with a sheaf of good points which weigh in the commercial results. We require a good many more real gas specialists out in the highways and by-ways of gas utilization.

Movement to Abandon Electricity Flat-Rate Charges.

THERE appears to be a definite movement in the electricity supply industry to secure liberation from flat-rates of charge and maximum prices, and to adopt in lieu of them a two-rate method of charging. It will be seen, from the "Electricity Supply Memoranda" this week, that there have been deputations to the Electricity Commissioners on the subject from certain organizations connected with the industry, in order to ascertain whether a bipartite tariff cannot be legalized by the Electricity Supply Bill (No. 2), and the present flat-rate system and maximum prices be displaced. It is not clear whether the organizations concerned in this movement have had any direct mandate from the industry to make the proposal, or whether they are simply acting in a preliminary manner. If the Institution of Electrical Engineers are the prime movers, that body is certainly not representative of the industry. The membership is representative of the professional element, but not of its administration, or of those who have supplied the capital. If the British Electrical Development Association have taken part in approaching the Commissioners, that organization also is not representative of the whole industry. It may be quite expedient to make the change, but Parliament will want to know definitely whether the industry in its entirety wants it, whether there is any general willingness to abandon the present tariffs for the proposed new ones, how it will work in relation to the different classes of consumers, and whether any enactment should take an obligatory or merely purely permissive form.

What are the reasons for the contemplated change? There are the old ones. Of these the first is that if a fixed primary charge is made on some generally applicable basis, with a secondary low uniform charge per unit no matter the purpose of use, the system will do away with the need for duplicate meters and wiring. The second is that it will conduce to a larger use of current by individual consumers for purposes other than lighting, as the larger the consumption the lower will be the average cost per unit—the average of the primary and secondary charges added together. A new reason for the change is that it is generally admitted that many electricity undertakings have, in the circumstances of to-day, numerous small consumers who are a dead-loss to them; and that the maximum charges that are allowed will not meet the cases of these consumers. Something more is required which will ensure that such consumers are not a burden on the profitable ones or on the ratepayers. The small lighting consumer has become a less attractive proposition since the introduction of the metallic filament lamps which give a much higher efficiency than the carbon filament type. Paradoxical as it may seem, the case for the two-part tariff is being constructed largely on a condition of things—the patronage of the small consumer—which the electricity industry has hitherto been making a hard fight to obtain, particularly in connection with the housing schemes. If it is necessary, to ensure the costs of the service, for a consumer to use over 100 units of electricity per annum, or (say) £5 worth, then those who have been working with capital, materials, and labour costs at the level they are to-day confess to having been pursuing a very foolish policy in trying to connect to their mains more of these small lighting customers.

In making this move for a change of tariff to the two-part form, it is not likely the parliamentary authorities will accept for the primary charge proposals which have not an electrical basis—such as rateable value, or the floor area of rooms. This, we think, is fairly well recognized by those who are working for the change. So far as is gathered from what has been allowed to become public, the primary charge, it is proposed, should be based upon the electrical capacity of the apparatus or appliances installed. That is a more rational proposition than is the usual practice where a two-part tariff at present exists. Is it not likely that this new movement to legalize the two-part tariff has been stimulated by the change effected by the Gas Regulation Act in the method of gas charging?

Tar-Spraying and Discharges into Streams.

THE case reported in our "Legal Intelligence" last week, in which the Chesham District Council had a claim against them for damage for the pollution of and injury to watercress beds, leaves the matter of noxious surface discharges into streams in a very unsatisfactory state; but the value of the tar-spraying of roads in the public interest—from the points of view of the users of the roads and the improvement in surface durability, and therefore reduction of maintenance costs—is so well established that we do not think the issue of the case will do anything to cause a reduction of the practice. The action arose over the injury to certain watercress beds which it was alleged had been occasioned through the discharge into them of noxious matter from the tarred road surfaces, which discoloured and withered the leaves of the cress, and rotted the roots, around which a black oily mud accumulated. These conditions had only occurred after the neighbouring road had been tar-sprayed, and then not until the winter, when there were frost and snow, which were supposed to disintegrate the tar cover, and set free in the surface water which ran into the stream the phenols of the tar. That is the theory. It is the one accepted by Mr. Justice Salter because he could not find a better. The defence suggested that as spring water was supplied to the beds at a constant temperature of about 50° at all seasons, the rush of cold water set up by the thaw of the frost and snow caused the trouble. But unfortunately this does not account for the oily black mud which accumulated about the roots of the watercress. It was clear that his Lordship was perplexed by the opposing currents of chemical evidence; and, in the midst of his uncertainty, the theory that the phenols were at the bottom of the trouble was the one that appealed to him. We did not hear the evidence, nor have we seen any complete report of it; and so we are not aware whether an analysis was put in of the oily black mud which clogged the roots of the watercress, and caused them to perish. The proportion of acids from the tar in the bulk of the water would be infinitesimal; and there is no proof that they would have any effect upon the growth of watercress. It would therefore be interesting to know whether the trouble is not due rather to the liquid droppings upon the tar-hardened surface (and which were formerly largely absorbed by the road itself) than by any direct washing of the acids from the tar. The road is said to be well used for motor traffic; and where there is motor traffic—whether or not the road is tar-sprayed—there is generally in the surface water a considerable film of oily matter, and in the mud a good admixture of oil. This may partly account for the black oily mud which is spoken about, and which may be at the bottom of the deleterious action of which there was complaint, and for which damages were claimed. The judgment only deals with the passing into the stream of noxious matter, whatever its source, and not with any road treatment which is a public advantage. Unless the decision is reversed, what it amounts to is that all surface water must be rendered innocuous before being discharged into streams, if there is any likelihood of its doing harm. Anyway, the judgment (as previously remarked) leaves the matter in a very unsatisfactory position.

Fuel Economy.

In dealing with this subject in the editorial columns last week, when referring to Mr. S. H. Fowles' paper before the Iron and Steel Institute, allusion was made to the fact that higher

boiler efficiencies could be obtained by gas-firing than the figure quoted by the author. Major Gregson has also raised the point in the "Iron and Coal Trades Review," and without any desire to disparage what can be done by the gas-engine using clean blast-furnace gas. He quite concurs in the statement that, using 636,000 c.ft. of 100 B.Th.U. gas, some 6500 H.P. would be available by using a modern large gas-engine. But the Major holds that the steam alternative has not received fair treatment. His argument runs as follows: Presumably, ordinary coal-fired boilers were used to generate steam; the gas being burned with a large excess of air, the resultant boiler efficiency being low. Furthermore, it would appear that the engines used for developing power must have been of inefficient type. Assuming the installation of a modern turbo-generating set working at 250 lbs. per square inch with steam superheated to a temperature of 700° Fahr., then there would be no difficulty in getting 1 shaft H.P. for 10,000 B.Th.U. in the steam. Regarding the generation of the steam from blast-furnace gas, if a special boiler of the "Spencer-Bonecourt" type be used, complete with economizer and air preheater, a boiler efficiency of 90 p.ct. is obtainable, which figure, combined with that given above, results in 1 shaft H.P. for approximately 11,111 B.Th.U. Hence the horse power obtained by the steam plant from 636,000 c.ft. of blast-furnace gas would be 5780, which is only 10 p.ct. less than that realized by the modern gas-engine plant. Major Gregson thinks this 10 p.ct. lower output is more than counterbalanced by the increased reliability of the boiler and turbine plant, and by the lower annual sum to be met for interest on capital and depreciation on the steam plant compared with the higher-priced gas-engine plant. This is not a generally accepted view.

Introduction of Oxygen into the Holder.

There is a point in the article by Mr. E. A. W. Jefferies on "The Relative Efficiency of Gases in High-Temperature Heating," in the "Journal" for April 6, on which we should like the views of readers, and we know the author would also appreciate them. The final paragraph of the article stated: "This important matter of flame temperature, which is the basis of efficiency, is largely under our control, because, at no extra cost per foot of gas, we can introduce oxygen into the holder quite safely up to 5 or 6 p.ct. of the whole volume, and by this means increase the rapidity of combustion and flame temperature as far as is found practicable and profitable." In a revised copy of the note, it is seen that the "5 or 6 p.ct." has been converted into "up to (say) 4 p.ct." The difference is not great, but the reduction is significant. Personally, we should like to know what the term "quite safely" covers. There may be gas engineers and chemists who look quite favourably on the proposal. We should be pleased to hear from them, and from those (if any) who hold contrary views.

Pure Air and the Coal Strike.

Many people have noticed that since there has been no (or little) coal to burn, the air of the Metropolis and other cities and towns has become more wholesome. The miners should perhaps be thanked for the demonstration they have enabled the country to make. A correspondent of "The Times" shrinks at the idea of returning to the old air-polluted conditions when the miners get to work again. We sympathize with him, as well as with that prominent group of architects who sent a joint letter to our contemporary suggesting that now is the time for action, when we can "see, breathe, smell, touch, and taste the benefits of reform." They believe the time is ripe for the London County Council and the City Corporation to take-up the question, and, if necessary, obtain parliamentary powers for controlling the use of soft coal. Daily, these gentlemen are gnashing their teeth at the destruction wrought by coal smoke, just as every housekeeper gnashes hers over the labour wasted by the use of coal-ranges and open fires. We had not observed this; but the names of those who signed the letter are a guarantee of the truth and a warrant for the fullest belief. They regret the hindrance to reform created by the gas companies ceasing to hire-out gas stoves and ranges, and by the raising of the price of gas. If heating efficiency of gas-fires is considered in relation to price—cleanliness and labour-saving advantages not being taken into the calculation—it will be found that gas prices are not any more prohibitive than coal prices. As to the hiring-out of gas appliances, if those who seek reform will only provide cheaper capital, materials, and labour, then hiring-out will soon be restored with greater vigour than has ever been witnessed.

Gas Oil and Fuel Oil Imports.

The figures for the oil imports for the past month and the first four months of this year make prominent the facts that fuel oil has had an enormous spring in volume and gas oil has been shrinking away from all semblance with its previous figure. For the former fact, the coal strike—when it threatened and when it actually came—is no doubt responsible. The imports of fuel oil last month amounted to 46,588,689 gallons, compared with 33,850,764 gallons in April, 1920. In the past four months, they reached the considerable figure of 149,944,049 gallons, as against 86,726,986 gallons. Of gas oil last month, we were the recipients of only 3,067,510 gallons, compared with 7,168,314 gallons in April, 1920. In the first four months of this year, 15,234,029 gallons came into the country; in the corresponding months of last year, 19,586,554 gallons.

Gas Coke Exports and Values.

Despite the coal strike, during April some 606,548 tons of coal were exported; but this compared with 6,350,869 tons in April, 1913, and 1,995,895 tons in the same month of 1920. Of gas coke, only 28,631 tons were sent out of the country last month, compared with 45,391 tons in April last year. Of "other sorts" of coke, 8585 tons were shipped, as against 45,597 tons in the corresponding month last year. The value of the gas coke sent abroad last month was £62,685, or an average of about £2 3s. 9d. per ton. During the four months of this year, 200,342 tons of gas coke were shipped, representing a value of £531,571. Compare this with the first four months of last year when 262,968 tons of gas coke were exported; the value being £1,251,524. The value per ton during the past three months was £2 13s. 0·7d.; it was £4 15s. 2d. in the corresponding period of last year.

Gas Incombustibles Committee.—There was to have been a further meeting of the Committee to-day, Wednesday; but we are informed by the Secretary (Mr. W. H. L. Patterson) that it has been postponed.

What Big Industrial Consumption Means.—Pointing to the importance of encouraging the use of gas for industrial purposes, Mr. W. A. Ehlers, Industrial Fuel Engineer to the American Gas Association, cited one town where seven consumers were taking 9 million c.ft. of gas per day. This, he said, translated into terms of domestic consumption in the average town, would be equivalent to the capacity of a plant supplying a population of 300,000, with at least 75,000 to 80,000 meters in service.

Fuel Alcohol Developments.—The "Engineer" says that commercial interests are now giving most careful attention to the production of fuel alcohol on a scale commensurate with the needs of the growing body of consumers. Important developments are reported by the Distillers' Company, which has been conducting experimental work abroad. It is stated that this Company are now in a position to import fuel alcohol at the rate of about 7,000,000 gallons per annum. It is true that this quantity would only represent a comparatively small percentage of the total fuel oil imports into Great Britain, but even it cannot be made available to users unless the necessary legislation is passed to enable the spirit to be imported and placed on the market duty free. It was intended that the necessary Bill should have been introduced by the Government into Parliament; but nothing has yet been done. Action is, however, being taken by the Motor Legislation Committee to secure the redemption of the promise made in this connection; and it is hoped that the pressure which is to be put on the Government will have the desired effect.

Increased Yield with Steaming.—Mr. C. J. Hauschildt, of Davenport, described to the members of the Iowa District Gas Association the results of steaming retorts at two of his plants. The steam is admitted at 20 lbs. pressure, at the back and on the bottom of the retort. To obtain the best results, the heats must be high; but no trouble from naphthalene will result from these high heats, he said, as the blue water gas absorbs the naphthalene as fast as it is made. The high heats permit of heavier charges being worked, as he now gets into the retort 485 lbs. per charge, as compared with 433 lbs. without steaming in horizontal three-quarter depth benches of sixes. The coal is carbonized for four hours; and then there is steaming for two hours, before the retorts are drawn. In one of the plants referred to, it has been found possible to increase the yield 14 p.ct.; while the other shows 26 p.ct. increase, though a lower B.Th.U. gas is being sent out from the latter. Little difference has been noted in the boiler fuel per 1000 c.ft. with or without steaming. Since steaming, stand-pipe troubles have been completely eliminated, as well as retort-scurfing. The coke produced is hard, and of good quality.

OBITUARY.

JAMES HUGHES CORNISH.

A great many of the older readers of the "JOURNAL" will learn with a feeling of sincere personal regret of the death, on Thursday, the 12th inst., of Mr. James Hughes Cornish, who for nearly half-a-century had filled, with credit to himself and advantage to the undertaking, the position of Secretary and Manager to the Bridgwater Gas Company. Mr. Cornish, who had reached the advanced age of ninety, enjoyed up to the end of 1919 remarkably good health; and even up to a few days before his death he was able to spend a short time daily in his garden.

A native of Taunton, Mr. Cornish began his long connection with the industry at the gas-works in that town. It was in February, 1859, that he took up the position of Manager to the Bridgwater Gas Company, from which he retired in 1904, after a period of service extending over 45 years. Subsequently, he was appointed a Director of the Company, with which, therefore, at the time of his death, he had been connected for altogether 62 years. When he relinquished active management of the concern, the Directors presented him with a handsome silver tea service and an illuminated address which expressed their high appreciation of his long and valued service. That this appreciation had been well earned was clear; for under his administration the make of gas doubled itself over and over again, and the undertaking was always most prosperous. Outside his own town, he will be remembered as having been President of the South-West of England District Association of Gas Managers.

Mr. Cornish died at Bridgwater, with whose business life he had thus been associated for so many years, and where he was held in high esteem by a wide circle of friends. On his retirement, he was succeeded as gas manager by one of his sons, Mr. J. Hughes Cornish, who still holds the position.

The funeral took place last Sunday week, and was attended by a number of employees of the Gas Company.

Mr. ARTHUR EASTON, who died on Tuesday of last week, after a severe illness extending over some six or seven weeks, had been Engineer and Manager to the Faversham Gas Company for the past twenty-one years, having been appointed to that position in February, 1900, in succession to Mr. R. Darney. Previous to that time, he was with the Commercial Gas Company. Mr. Easton caught a chill soon after Easter; and this developed into influenza, and later into pleurisy and double pneumonia. Only a week before his death, his health showed considerable improvement, and he was hopeful of an early resumption of his duties. Of a retiring disposition, he possessed great charm of manner and geniality, and was thoroughly conscientious and capable in his work. At the time of his death he was about 49 years of age, and he leaves a widow and two young daughters.

An announcement has appeared in "The Times" that Dr. EDWARD B. ROSA, Chief Physicist at the Bureau of Standards, Washington, with which organization he had been connected for seventeen years, died suddenly at his desk on Tuesday of last week. Dr. Rosa was one of America's leading scientists, and known to scientific men in England from his attendance at scientific meetings, and on account of his numerous publications. He had been Secretary of the International Science Association. Pressure of work during and since the war had seriously impaired his health.

The death occurred on the 9th inst. of Mr. W. BURTON KING, who had for over forty years been the proprietor of the business of Messrs. W. B. King & Co., of the Tar and Varnish Works, Ipswich. He had been in indifferent health for some time, but on the day of his death had spent the morning in his office writing, and was apparently decidedly better. Death came quite suddenly, while he was waiting for lunch. He was in his 73rd year.

PERSONAL.

It is gratifying to learn that Mrs. Bennett has received a wireless message from her husband, Mr. C. VALON BENNETT, of Rochester, to the effect that he has arrived at Cape Town, and is feeling greatly benefited by the change. Mr. Bennett, it will be remembered, was ordered to take a complete rest from business, and sailed for South Africa on the 29th ult.

Mr. HORACE A. FLOATE, who a few weeks ago retired from the service of the South Suburban Gas Company (after holding the position of Accountant for about 27 years), was the recipient on Tuesday last week of a handsome silver rose-bowl as a token of the esteem in which he was held by the staff of the Company.

Announcement is made in the May number of the Gas Light and Coke Company's "Co-Partners' Magazine" of the appointment of Mr. F. M. BIRKS as Mechanical Engineer at the Beckton works, and of Mr. N. STREATFEILD as Assistant Solicitor to the Company.

Mr. T. H. POULSON, the Engineer and Manager of the Stafford Corporation Gas-Works, has been elected a Fellow of the Chemical Society.

Mr. D. SPARVELL, J.P., the Chairman of the Yorktown and Blackwater Gas Company was last week elected an Alderman of the Surrey County Council.

LA SOCIÉTÉ TECHNIQUE DE L'INDUSTRIE DU GAZ EN FRANCE.

IN the "JOURNAL" for April 27 we gave a brief notice of the coming Congress of the Société Technique, in Tours, on June 14, 15, and 16. Circular-letters reproduced in the current number of the "Journal des Usines à Gaz" officially convene the meeting and announce the final programme.

The business of the Société will be disposed of before lunch on June 14; and the Congress will be opened by the Presidential Address at 3 p.m. This will be followed by the announcement of the names of prize and medal winners. The remainder of the day will be spent in visiting the local gas-works; and the Compagnie du Gaz will give their banquet in the evening.

The following morning the Committees on Gas Manufacture, Appliances, and Education will present their respective reports, to be followed by various technical papers and the discussions thereon. In the evening a visit to the central electricity station has been arranged, and there will take place the Société's subscription dinner.

Thursday, June 16, will be devoted to an extended excursion, starting with a visit to the Haye-Descartes paper-mills and a luncheon on the Company's invitation. Then, after inspecting the water-power electricity works under construction at the confluence of the Creuse and the Vienne, more serious matters are likely to be forgotten in a tour by motor to five of the finest châteaux of the countryside.

We see that the Congress in Tours is to be followed immediately by a "Gas Week," which the Société is to organize in Paris from June 20 to 24. It is intended that this "Gas Week" shall offer special opportunities to the many assistant engineers, &c., who are unable normally to acquire the wide general knowledge essential to a future chief.

The mornings will be devoted to lectures by leading gas men, and the afternoons to visits. An earnest appeal is made to members of the Société to release as many of their juniors as possible for the week's instruction. The programme is as follows:

June 20, *a.m.*—Theory of Gasification, by M. Laurain, Past-President of the Société.
p.m.—Visit to the La Villette works.
June 21, *a.m.*—Tars and Benzoles, by M. Chervet, Chief Engineer of the Compagnie du Gaz de Lyons.
p.m.—Visit to the Gennevilliers works.
June 22, *a.m.*—(*a*) The Theory of Water Gas, by M. Cocu, Deputy Chief Engineer of the Société, and (*b*) The Practice of Water Gas, by M. Casaubon, Managing Director of the Saint-Josse Company and of the Belgian works of the Compagnie Générale.
p.m.—Visit to the headquarters of the "Chauffe Rationnelle," and a conference with M. Decluy, of the Central Coke Committee.
June 23, *a.m.*—Relations with Consumers, by M. Bertin, the head of the Société's propaganda work.
p.m.—Visit to the works of the Compagnie de Fabrication des Compteurs et Matériel d'Usines à Gaz.
June 24, *a.m.*—The Rôle of the Commercial Agent for Coal and Coke, by M. Capuron, Director of the South-Western Gas Union.

GAS AT THE NURSING EXHIBITION.

DURING last week the Royal Horticultural Hall, in Vincent Square, Westminster, was visited by a large number of those who are connected with the medical profession, for there was being held the Eleventh Annual Nursing Exhibition and Conference. The success attained by the Gas Light and Coke Company in enlisting the goodwill and active co-operation of doctors and nurses is well-known throughout the industry; and in connection with this campaign, the Company invariably make an effective appeal to the judgment of visitors to the Nursing Exhibition. This year proved no exception to the excellent rule which the Company have thus laid down for themselves; their display, it may confidently be said, having been one of the most attractive features of the exhibition.

One of the roomy annexes to the hall was occupied, and this the Gas Light and Coke Company had converted into a tastefully fitted suite of rooms for nurse and child, comprising night nursery, day nursery, nurse's bed-sitting room, and bath-room, with kitchen cabinet, so that if the nurse desired to do a little invalid cooking this might be possible without going downstairs. This patent combined kitchen and scullery cabinet was a novel element which was much admired. How many flat-dwellers, and others who are anxious to save space or labour, must wish that they possessed a contrivance like this, which could hardly be out of place in any living room. The cabinets—manufactured by Sprake's Kitchen and Domestic Cabinets Company, of Weston-super-Mare—contain a gas-cooker (that seen last week was a Davis "Tween"), shelves, sink, water supply, draining board,

plate-racks, &c., with a roomy cupboard for utensils. There is a flue over the gas-stove; and the upper portion of the cabinet, and around the stove, is lined with asbestos sheets. In fact, within the space of 7 ft. by 4 ft. by 2 ft. 6 in., there is a complete kitchen. In this section of the exhibit there were also a Ewart towel-rail and "Lightning" geyser for the bath, with a Davis gas-heated radiator (with towel-rail) for warming the room. In the bed-sitting room, too, there was a most convenient fitting for a situation of the kind in the form of a Wright new "Cabinet" combined gas-fire and cooker, which has been designed expressly for use in flats, suites of chambers, &c. It has a "Thermo X" fire front; and above this is a good-sized grilling oven, with fall-down front door. The top is closed with a hinged cover; and the grill deflectors may be lowered or raised as required for boiling or grilling. There was also on a side table an inverted incandescent gas reading lamp. The gas-fitments of the day-nursery embraced a Keith iron, an efficient Richmond "R.H.D." fire, and a Davis incinerator; while for the night-nursery were provided a Richmond "New Persian" fire, with side boiling-ring, and a "gas night-light"—the "Therm Minor" patent upright incandescent gas-burner, whose small consumption of 1 c.ft. per hour renders it eminently suitable for such a purpose. The main lighting of the exhibit was controlled by pneumatic switches.

SIXTY YEARS AGO.

[From the "Journal" for May, 1861.]

Sales of Gas Act.—Official dies, to be impressed on meters, have been received by several provincial inspectors from the Exchequer Office; and they are now prepared to stamp meters. The stamp is not calculated to increase our national reputation in the art of design. It is simple, to the extreme of meagreness; the meagreness of design being carried to such excess as to grudge the introduction of the proper number of letters to designate the object to which the stamp is to be applied. The word "Gas," in letters disproportionately large for the size of the die, is a very vague designation of the apparatus to be stamped; and there is ample space for "Gas-meter," had not the designer's skill been restrained by economical considerations. Economy has, indeed, been practised in one respect with considerable advantage. Instead of distinguishing each district by name, which would have required the cutting of a great number of dies, each of which would have presented a different appearance from the other, the districts are to be distinguished by numbers—No. 2, for example, signifying the Sheffield district. The stamp is to be impressed on molten solder; but no specific directions are given in the Act on what part of each meter the stamp is to be placed. In foreign regulations for the stamping of meters, particular attention is paid to the prevention of fraud, by fixing the stamp on a part of the meter from which it cannot be removed; but the Sales of Gas Act leaves this point optional with the authorities by whom the inspectors are appointed, and, in the want of instructions from them, the inspectors are to exercise their own judgment, and place the stamp where they please. If there be danger of fraud or counterfeits, the want of a regulation determining the place where the stamp is to be impressed, and the facility with which the stamp itself might be imitated, offer temptations for such practices.

Mr. Hughes and his "Cooper's Tube."—Mr. Hughes and his bromine test got severely handled during cross-examination [on the Bolton Gas Bill]. It is well known that he travels with his "Cooper's tube," and that he is prepared to say what is the value of any gas by the indications of that instrument. He was compelled, however, to admit that he has to resort to the photometer to ascertain the co-efficient to be used as a multiplier for converting the percentage of absorption by bromine into the value in illuminating power. According to Mr. Hughes, 6 p.ct. of condensation is equivalent to 15 candles, while 13·1 p.ct. of condensation in the gas made at some mill in the vicinity is called the equivalent of 29-candle gas. In one case the co-efficient used was 2·5, and in the other (without the slightest authority) it was reduced to little more than 2. Indeed, he now admits the truth of what we have long asserted, that various qualities of coal require different co-efficients; and we have stated that this variation ranges from 1·5 to 3·5. It was, no doubt, in consequence of some inaccuracy in this respect that Mr. Hughes estimated the illuminating power of the Birmingham gas at 16 candles, as recorded in one of his tables produced before the Committee on the Metropolis Gas Bill of 1860, while the Company have never claimed for their gas a higher illuminating power than 12½ candles. In the hands of an experienced chemist like Mr. H. H. Watson, the oxygen test is the most certain of all the chemical tests; and his co-efficient 0·1334 appears to indicate with accuracy the illuminating power, in sperm candles, of any gas when consumed at the rate of 5 c.ft. per hour in burners of suitable construction for the combustion of that quantity of gas.

An Opportunity for British Manufacturing Firms.—As from July 16 until Aug. 16, there is to be an International Gas and Electricity Exhibition at Bois-le-Duc, Holland, an announcement with regard to which is advertised in this issue. British manufacturing firms of gas apparatus, &c., for domestic and industrial use will no doubt have every consideration given to their requirements, if they will apply as directed by the advertisement.

ELECTRICITY SUPPLY MEMORANDA.

Flat-rates for electricity have got to come to an end. This seems to be the almost universal view of the electricity supply industry. The fact transpired during the discussion on the papers by Mr. J. R. Blaikie and Mr. J. W. Beauchamp, which were noticed last week. The changed conditions have brought this about; and so the flat-rate must go, and with it the maximum charge. Higher maxima are not alone sufficient. The peculiar circumstances of supply in the electrical industry ask for something more, in order that there may be the necessary elasticity in charge to promote development of business in every direction. Of course, there has never been a single flat rate in any electricity undertaking. There has been a flat-rate for each purpose; and the flat-rates in each undertaking have varied in a degree which could not always be justified by any of the principles which were supposed to apply to the charges at their inauguration. The principles have evidently led astray those who believed in them; for in the report before us of the discussion, it is freely admitted that there are many electricity users to-day who are a dead-loss to the undertaking; and the losses incurred through and by them have to be made up from the better paying consumers or from the ratepayers. One contributor to the discussion stated that, generally speaking, consumption must be in excess of 100 units per annum, or the consumer will not be profitable. Another speaker said a consumer's account must be at least £5, or he is not a paying proposition. Yet we have seen electrical men arguing until they were almost blue in the face over getting—if nothing more—the lighting only in the housing schemes, and for working-class dwellings! The current consuming power of these consumers for lighting is almost negligible having regard to the costs of generation and distribution, and the reduction of the current required per lamp of a given candle power. And according to report the threat has come that some German and Austrian scientists are working on a lamp that will have an efficiency of 1 candle-power-hour per 0·25 watt. If ever this comes about in an ordinary lamp, then there will be another movement of the line between profitable and unprofitable consumers, and may Heaven defend the eyesight of the people better than is done to-day. There is no need for concern over this matter at present. The physical barriers to such an eventuality is a pretty stout one. The gasfilled lamp—the previously named "half watt"—is not all that it should be; and its shortcomings are emphasized by experience. However, the higher efficiency lamp has not worked well for the flat-rate tariff; and this tariff has stood in the way of the development of other uses. It is the "other uses" that electrical men want to develop. In the circumstances of dear capital, dear labour, and dear materials, it is business with existing consumers that it is desirable to extend, without the expense of additional meters and wiring—that is to say, extend within the capacity of the present house installations. The bipartite tariff would help in this direction; and it is believed that under it, it would be possible to make every consumer a paying proposition—even the small ones, providing the basis on which the lump (or first) charge is based is a sound electrical one. A charge founded on rateable value or the superficial area of rooms is now being laughed at. In it there is no relation with electrical use. It is now urged—and very properly—that a simple tariff is wanted which would have some relation to the requirements of individual installations, and with a subsequent charge per unit according to the circumstances of use. There have been deputations to the Electricity Commissioners to suggest that in the Electricity Supply Bill (No. 2) there should be provision for legalizing the abandonment of the present maximum and flat-rate charges, and making compulsory the institution of a two-part charge. The "Electrical Times" suggests that the Gas Regulation Act forms a precedent for making a change; and it says there is no logic in treating one industry differently from others. Very well. Perhaps the bipartite tariff could introduce heat units as a basis of charge, the same as is done by the Gas Regulation Act. It is also observed that some men in the electricity industry would like to be relieved of the obligation to supply unprofitable consumers. They are curious fellows. They do not like unprofitable consumers, and yet they strain every nerve to get them connected-up.

A Bipartite Tariff.

Concealing Differences in Charges.

There is another reason for establishing the two-part tariff as the legal means of charging for electricity supply. The electricity industry is expecting, if it is not altogether pleased with, the divided system of providing electric energy in this country for both domestic and industrial uses. The owners of some undertakings regard with extreme displeasure, others with approval, the trend of affairs which will bring about the centralization of generation in large stations under a body distinct from the local retailers of the current. The feeling is anything but general that this is going to be a development which will yield nothing but advantage to the electricity industry. But there are some who foresee another drawback in centralization of generation; and it is that the public will want to know why it is that one town drawing from the common source of supply can sell electricity cheaper for the different purposes than another town drawing from the same source. Of course, according to the

distance from the supply source, there must be variations in the first cost of the energy; and differences in demand will make variations in the results of the calculations as to the proper charge for any one town. According to a memorandum issued by the British Electrical Development Association Joint Committee on Tariffs, the bipartite tariff will conceal all this. Consumers must by propaganda be taught that variations in the first part of the charge are inevitable according to the circumstances of the town and the capacity of the apparatus or the appliances installed; but it is thought that between town and town and consumers for different purposes the second part of the charge—the charge per unit—need only vary to quite a moderate degree, and in fact may be nearly uniform. It is believed that this would save a lot of dissatisfaction, which the great difference between flat-rate prices in various towns at present occasions.

Increased Assistance from Fuel Oil.

Intelligence as to conversions of boilers at electricity stations from solid to liquid fuel has been coming in fast of late. Electrical engineers may consider themselves fortunate that there were, with a protracted coal strike on, good stocks of fuel oil available in the country through the large imports of the last few months. Electrical engineers did not know much about the use of fuel oil before; they are getting to know more now. The conversion of coal and (or) coke fired boilers is not a big operation; but it is, of course, the better plan to have it properly done, though home-made burners, suitably designed and fitted, may be made to give as good an efficiency as proprietary articles. But to ensure good efficiencies, it is better to have the work done in a thorough manner. It is not necessary, unless fuel oil is going to be used *per se*, for a baffle to be built upon which the flame can impinge. The atomized oil can play on to a heap of firebrick, or it can be used as an auxiliary to coal or coke fuel, and be directed on to the heated fuel. Of course, care is required in the use of the fuel, in order to secure complete combustion of the oil spray or vapour, so as not to allow it to be carried by the draught to the back of the furnace. If any of the spray or vapour goes past the fire into the flues, an explosive mixture may be formed. That large boiler conversions have been so quickly made, and work is going along so successfully, shows that, with ordinary precautions in fitting and manipulation, no serious difficulties need be apprehended. The electrical papers, of course, have been devoting some attention to the matter, and so have the daily papers. The latter have been well primed by those interested in the sale of fuel oil. The opportunity was a fine one, and one not to be missed. It is stated that some of the authorities who have converted their boilers from solid fuel to oil burning will not revert to the former, because of the advantages of the latter. Their decision will not rest on present benefits or the collateral advantages of oil, but on future relative costs of oil and other forms of boiler firing. This is a matter that was discussed in the "Memoranda" last week. However, there is much thankfulness to fuel oil for having rendered such great help in saving the situation for several electricity stations; yet there are many that have been giving short supply for ordinary uses, and tramway services in a number of places have suffered drastic diminution.

Light from Ounces of Coal.

One of the silliest comparisons between gas and electricity that it has ever been our lot to read has appeared in the "Bexhill Chronicle" from a correspondent signing himself "Economy;" and an amateur educator of the public on the subject—a regular writer in our seaside contemporary, signing himself "Chiel"—adopts the figures of "Economy" with a childlike faith in their genuineness. The latter wonders how many people have any clear idea of the relation between the gas and the electricity they use and the coal required to produce it. He proceeds to misinform them by quoting the assertion of "Economy" that the lamps in general use in the household require, on the average, the following amounts of coal for their maintenance in use: "Gas, 7½ oz. per hour of burning; and electric, 2 oz. per hour of burning." Marvellous! "Economy" further says that the gas-works produce in operation some 3 oz. of coke for sale out of each 7½ oz. of coal, leaving the comparison 4½ oz. of fuel used for gas and 2 oz. for electricity. And "Chiel" absurdly adopts the comparison! It will be observed, in the first place, that "Economy" does not state the relative candle power of the lamps. He merely says "lamps in most general use." It may be declared at once that for equal candle powers "Economy" is guilty of a gross falsehood; and did we know his name, we would make the same statement direct to him. In the gas industry British thermal units are now dealt in by several undertakings. It is quite easy with the ordinary low-pressure inverted gas-lamp to get 40-candle power per 1000 B.Th.U. Carbonizing coal in horizontal retorts, it is a moderate figure to take 6,000,000 B.Th.U. produced as gas per ton of coal, which would give $40 \times 6000 = 240{,}000$ candle-power hours. In addition, there is half the weight of the ton of coal available for sale as coke (or about 14 million B.Th.U. of the original heat value of the coal), 10 gallons of tar, and from (say) 25 to 28 lbs. of sulphate of ammonia. By the more modern method of carbonizing in vertical retorts and steaming the coal charges, it is easy to produce in the form of gas (say) 8,640,000 B.Th.U. per ton of coal, which means that in light 345,600 candle-power hours can be obtained, *plus* about 8½ cwt. of coke for sale, 10 gallons of excellent tar, and approximately 28 lbs. of ammonia. If the gases from coal retorts and from water-gas or "carburetted hydrogen" plants are mixed, about 9,500,000 B.Th.U. are obtained per ton, which would give 380,000 candle-power hours, with 6 or 7 cwt. of coke for sale, tar, and ammonia. With complete gasification of the coal, about 20,000,000 B.Th.U. are obtained, which would give 800,000 candle-power hours per ton of coal. We do not suppose that at Bexhill a unit of electricity is generated for less than 5 lbs. of coal (perhaps more) per unit, which is equal to 448 units per ton, and no coke, tar, or ammonia are produced. And with the commonly used metallic filament lamp, a unit of electricity will give 800 candle-power hours, or 358,400 candle-power hours to compare with the figures we have given for various systems of gas production from which secondary products are realized, and have to be credited to them. In the form of gas, 100,000 B.Th.U. can be purchased in South London for 10½d.; and in other places from that figure up to (say) 18d. The 100,000 B.Th.U. will give 4000 candle-power hours. A unit of electricity will only give 800 candle-power hours. What does a unit of electricity cost in Bexhill? Be it marked that the light from the 100,000 B.Th.U. is five times that from the unit of electricity. These are figures which can be proved photometrically and calorimetrically. What then of the foolishness of "Economy" and the readily duped "Chiel?" If this paragraph does not give them enough, we will take them into the region of heating, which is far more important in connection with the coal strike. "Chiel" would soon see then that his is a case of the blind leading the blind; and he would also understand who is the chief sinner in wasting coal—gas or electricity.

Tyranny of the E.T.U.

In the "Memoranda" for the 11th inst. there was noticed a case in which, acting on the instructions of the Electrical Trades Union, the unionist men of the Hackney Borough Council Electricity Department had refused to connect-up a would-be consumer's installation that had been made by non-unionist labour. The case, it will be remembered, landed the Council in the Police Court for failure to carry-out their legal obligations. While the law makes no provision for a case of this kind, and Mr. Forbes Lankester, K.C., the magistrate, had to fine the Council, he made his view very clear that the Union were acting tyrannically, and that their action amounted to a claim on their part that they could dictate to their fellow-subjects the class of persons they should employ to do private electrical work on private premises. The Hackney authority are going to appeal to the High Court to ascertain whether the position in which they were placed by the despotic act of the Union does not come within the plea of *force majeure*. The same matter has cropped-up at Swansea. The local branch of the Union has declared its intention to put into force a list of "*bonâ fide* contractors" for wiring purposes; and if the wiring is not done by one of these firms, and in accordance with the regulations of the Union, the members will refuse to connect-up. This is carrying trade unionism to arbitrary lengths to which the country will decline to be subject. The electricity supplying authority have no right to say by whom an installation can be made. All they are entitled to do is to examine an installation to see whether it complies with the electrical requirements, and, if approved, the consumer is entitled by law to a supply. That is the position; and the Electrical Trades Union have simply formulated a condition that prevents the giving of effect to the law should an installation be made by non-union labour. Trade unions that get out of their legitimate ambit will have to be put back into it by the passing of additional laws.

Strikes and Failure to Supply.

While referring to the question of a deficiency in legal control, there is another condition for which provision should be made. A "Legal Contributor" of the "Electrical Review" has been writing on the subject of the position of electricity purveyors in respect of failure to fulfil their contracts to supply in the event of fuel exhaustion due to a strike. He quotes from various law report sources, including the "JOURNAL," decisions that have some bearing on the question of failure to supply; and the conclusion to which he comes is this: These cases lead inevitably to the conclusion that mere inability from a business point of view to supply is no answer to a claim for penalties. Whether this inability is due to strike or lock-out, or to inability to procure coal, the undertakers remain liable for failure to supply. The answer of the consumer who cannot turn on his lamps, to the complaint of the company, "We have no coal," is clear and explicit. "You are under statutory contract to supply me with electricity, and you have broken that contract. You should have laid in sufficient coal to tide you over the period of a strike." That any consumer will ever attempt to assert his right to the above extent may be doubted; but it is important for those who are connected with the electricity industry to realize that they are not at present protected by any strike clause.

Mr. John M'Gilligan, who served his apprenticeship at Hartlepool, under the late Mr. Thomas Bower, has been appointed Assistant Gas Engineer to the Middlesbrough Corporation. At a social gathering of the Hartlepool Gas Company's employees, a farewell presentation was made to Mr. M'Gilligan by Mr. Arnold W. Branson, the Engineer and General Manager.

REINFORCED CONCRETE WORK AT PORTSLADE.

Brighton and Hove General Gas Company.

In the "Journal" for May 11 [pp. 316-21] we described the new carbonizing and coal and coke handling plant at the Portslade works of the Brighton and Hove General Gas Company, which the Engineer and General Manager (Mr. C. H. Rutter, M.Inst.C.E.) has been carrying out there. In the course of the article it was mentioned that the stage floor of the house, together with the coal and coke hoppers and coke-quenching bench, had been constructed on the Indented Bar Company's system. The stage-floor is believed to be the most extensive one in any gas-works in the country. Therefore it may be of interest to publish some further technical details of this portion of the work, which we are able to reproduce from the April issue of the "Indented Bar Bulletin." Part of this work was illustrated in our previous article, and the additional views and details now given have been supplied by the Indented Bar Company.

The reinforced concrete work carried out consists of coke-benches, overhead bunkers, charging floor, discharging floor, and 20-ton coke-hopper (to the order of Messrs. Drakes, Ltd., of Halifax, the Contractors for the carbonizing plant, and to the requirements of the Engineer), and two 50-ton coke-hoppers (to the order of the Gas Company). The charging floor had to be designed to carry two charging-discharging machines, each weighing 25 tons, and travelling from end to end of the house on steel rails laid flush with the floor. The discharging floor carries four machines—two coke-transporters for receiving the coke as discharged from the retorts, and, after elevation, discharging it through the windowways of the house on to the coke-bench, and two coke-machines for charging the coke-producers. These machines also run on rails from end to end of the house.

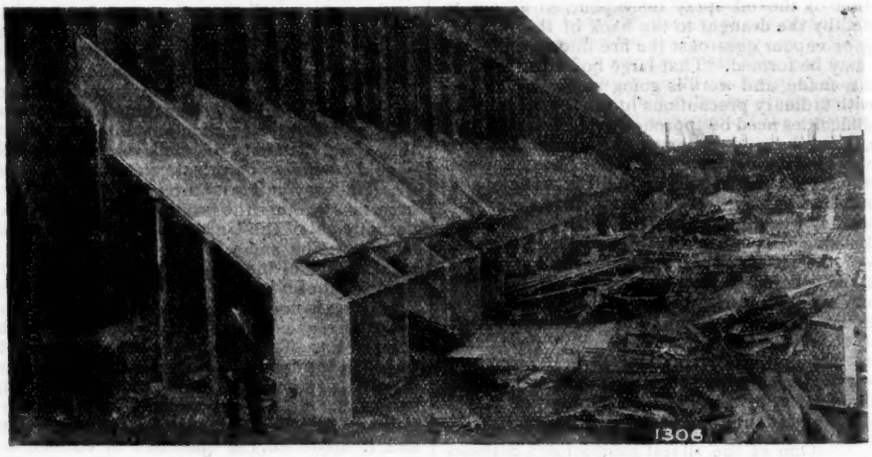


FIG. 1.—COKE BENCHES, CONCRETE STRIPPED.

The overhead coal-bunkers, which are situated immediately above the charging floor, had to be entirely independent of the floor, and are supported, as described later, on columns carried up from the ground level, and on the buckstays of the retort-benches. Both the floors and the coal-bunkers are subjected to varying stresses, both from the moving machines and the expansion due to the high heats in the retort-settings.

Coke-Benches.

The coke-benches are constructed along one side of the retort-house, and are each 127 ft. long, divided into thirteen bays. The width of the benches from the front edge to the top is 10 ft., and they slope at an angle of approximately 45°, being about 13 ft. above the ground level at the back and 5 ft. at the front. Baffles or ploughs are provided at the lower edge of the benches between each bay, to divert the coke into the skips as it is discharged.

The front supports consist of thin piers, 3 ft. wide by approximately 6 ft. high in front and 7 ft. 6 in. at the back; the slope at the top edge being a continuation of that of the slab of the coke-benches. These piers rest on base slabs 18 in. by 6 in. section; approximately 2 ft. 6 in. below the ground line. From the level of this base slab up to the point in the pier which forms the continuation of the beam supporting the benches, these piers are 6 in. thick; and thence upwards they are increased to 9 in. At the top side of the bench the beams supporting it are carried on the brick piers of the retort-house wall. The slab is 5 in. thick, supported by beams at 9 ft. 9 in. centres, each 8 in. by 5 in. in section. The top edge of the slab is shaped to conform to the outline of the wall of the retort-house.

The baffles or ploughs are triangular in shape, 3 ft. 8 in. long, 21 in. high, 5 in. wide at the upper ends and 26 in. wide at the lower end, which projects 9 in. beyond the lower edge of the slab; the outer face being curved. The front edge of the bench is stiffened by a beam 12 in. by 9 in. in section over-all. At each end of each bench a dwarf reinforced concrete wall, 21 in. deep and 4 in. thick, is provided; and a half-plough is constructed at the lower end of this wall. The whole of the benches are lined with 3 in. fire-bricks; and to retain these a 3 in. by 3 in. lip was formed with the slab at the lower edge.

Overhead Bunkers.

The overhead bunkers are seven in number, and each has a capacity of 90 tons. Their purpose is to supply the charging machines which feed the retorts. They present several interesting features, not the least of which is the method of support. Each bunker measures over-all 26 ft. long, 20 ft. wide, and 14 ft. deep; and the outlets are situated 32 ft. above the ground level and 23 ft. above the stage floor.

The bunkers are supported on one side by columns 34 ft. 9 in. over-all in height, 30 in. by 12 in. in section, resting on footings 4 ft. by 3 ft. The main beams supporting the bunker are 36 in. by 12 in. in section, formed monolithic with the columns on one side, and resting at the other end on the buckstays of the retorts; the spans being 22 ft. clear. Diagonal struts are formed running from a point 8 ft. below the top of the columns to a point 8 ft. along the beam; these struts being 9 in. by 9 in. section.

The columns are braced laterally in pairs (except the middle three, which are all braced together) at a point approximately 17 ft. above the ground level, and at the top by ties 9 in. by 6 in. in section. At the lower levels these ties are haunched all four ways into the columns; on the upper level they are haunched top and bottom only. The columns were constructed at 11 ft. 6 in. centres, to agree with the spacing of the buckstays; consequently the bunkers do not exactly fill the bays formed by the beams. The centre bunker and the next but one on either side are each supported on three beams. The remaining bunkers are supported on two beams in each case; and the ends are cantilevered out on either side. They are irregular in shape; the backs consisting of a slab 5 in. thick sloping at an angle of 45° from the mouth to within 21 in. of the top of the bunker; being surmounted by a wall of that height 9 in. thick. The front of the bunker is formed of a slab, set at an angle of 50°, 5 in. thick, surmounted by a wall of similar thickness, 7 ft. 6 in. in height. The end walls are upright, 13 ft. 6 in. in height and 5 in. thick.

The bunker bottoms are 5 in. thick, and are provided with six openings, each 36 in. by 14 in. in plan. The bunker walls are stiffened by 9 in. by 9 in. columns springing from the main beams. Stiffening beams run round the top of the bunker walls, 12 in. by 9 in. gross, and further beams, 12 in. by 7 in. net, in section, along the front and sides of the bunkers at the junction of the upright and sloping walls, and an additional beam of similar section formed on the back sloping wall 11 ft. from the mouth of the bunker. At the back of the bunker webs are constructed from the main beams to these stiffening beams, 6 in. thick, being 25 in. deep at the base, tapering to 12 in. where they join the stiffening beam. These webs can be clearly seen in fig. 3, which shows the back of three of the bunkers completed.

The two end bunkers are further supported by two webs 9 in. thick, supported on the end main beams, which are 20 in. by 12 in. in section, and extend from that level to the top beam round the bunker walls. The other side they are supported by two sloping struts, 9 in. by 9 in. in section, extending from the main beam next to the bunker to the top wall beam. The two bunkers on either side of the centre bunker are also further supported by 9 in. by 9 in. sloping struts, back and front, extending in each case from the main beam next on either side of the bunker to the stiffening beam along the side of the bunker.

Fig. 4 shows the space between two bunkers and the sloping strut from the beam supporting one bunker to the stiffening beam on the next one. This illustration also shows one of the problems which occurred in the construction of these bunkers. The bottom main bars of the roof principals in all cases are passed through

between the bunkers, and with the exception of the end bunker do not interfere with the concrete work. In the case of the roof ties beyond the ends of the end bunkers, however, the web supporting the side of the bunker had to be pierced so that the ties could pass through. As the weight of the bunker and the load of coal sets up particularly heavy stresses in these webs, the hole in the web, 8½ in. by 7 in. net, is stiffened by mild-steel plates on all four sides. In all cases where these sloping struts are inserted to support the bunkers they are tied by a 9 in. by 6 in. horizontal member, which extends through three bays of the beams.

A point of very particular interest occurred in this part of the work, as a result of the movement of the steel buckstays supporting the inward side of the beams, consequent on the very great heat generated when the retorts are working at full pressure. When the retorts are fully heated, the buckstays on which the concrete beams supporting the bunkers rest bulge considerably; and as they are tied at the tops, a rocking motion is set up at the point at which they support the concrete beams. Special iron castings were therefore made, the top surface of which is formed to the radius of the lateral movement of the stays. These castings were inserted on lead sheeting, to equalize the pressure set up, so that throughout the movement of the buckstays the height of the support of the concrete beams remains unaltered; the possibility of fracture in the concrete supports thereby being eliminated.

CHARGING FLOOR.

This floor extends down the length of the retort-house under the overhead bunkers. It is 285 ft. long by 23 ft. wide, and is constructed in three sections to provide the necessary expansion joints. It is supported 9 ft. above the ground level on columns formed at 11 ft. 5 in. centres, excepting at the two bays at either end, which span respectively 7 ft. 1½ in. and 9 ft. 10 in.

The columns measure 12 in. by 9 in. in section, and rest on footings 2 ft. 9 in. by 1 ft. 6 in. by 12 ft. deep. The two rows of columns are 10 ft. 3 in. apart, and the platform is cantilevered on either side, approximately 5 ft. 6 in.

On the inner edge the platform extends around the buckstays; the necessary spaces being formed during its construction. The main beams supporting this platform are 16 in. by 7 in., and

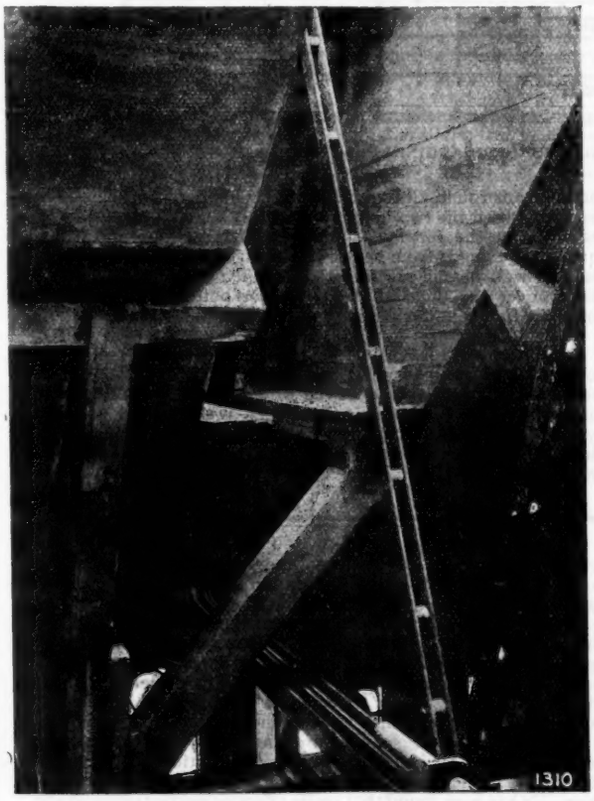


FIG. 2.—SLOPING STRUT SUPPORTING THE CANTILEVERED END OF THE OVERHEAD BUNKER.

extend down the length of the building. Further beams, 12 in. by 6 in. in section, span between the rows of columns, and extend to the edge of the platform, tapering at their extreme points to a section of 6 in. by 6 in. Additional beams, 10 in. by 5 in. in section, extend from centre to centre of the 12 in. by 6 in. secondary beams; and stiffening beams, 6 in. by 5 in. net in section, are formed on both edges of the platform.

The tracks for the charging machines, which, when loaded, have a weight of approximately 25 tons each, were formed on the slab immediately over the two 16 in. by 7 in. beams. Rebates 5 in. by 2 in. were left in the upper surface of the floor, to take the rails. The floor is paved with 3 in. blue Staffordshire bricks. The charging machine is provided with a ram to push the coke out of the retort; and when this operation is in progress very considerable stresses are set-up in the platform itself. To assist in resisting these stresses, sloping ties, 8 in. by 6 in. in section, are constructed from the base of eight of the columns in the inner row to the tops of the corresponding columns in the outer row.

DISCHARGING FLOOR.

This is similar in construction to the charging floor, with the exception that no diagonal ties were necessary, and the main beams are 10 ft. by 5 ft., whereas those in the charging platform

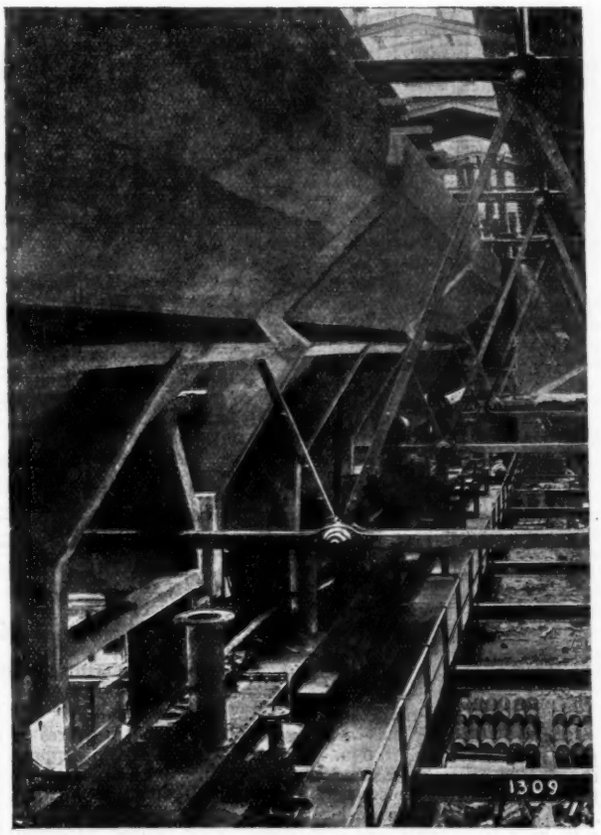


FIG. 3.—BACK OF THE OVERHEAD BUNKERS.

are 16 in. by 7 in. Also, in this case the inner edge of the floor is supported on brackets formed on the buckstays, instead of being cantilevered as in the case of the charging platform. In both cases the thickness of the floor slab is 4½ in. Above the discharging floor, and adjoining the top level of the coke-benches, hoppers are provided into which the coke, on being discharged from the retorts, is hoisted by the transporter, passing thence to the coke-benches and the skips which receive it at the base of the coke-benches.

TWENTY-TON COKE-HOPPER.

In plan this structure measures 14 ft. 9 in. by 14 ft. 3 in. overall, and has a depth of approximately 16 ft. It is supported by columns at each corner 15 in. square in section, resting on footings 5 ft. square in plan, 6 in. thick at the outer edges, increasing to 21 in. at the centre. The height of the columns overall is 24 ft.

The bunker bottom slabs slope at an angle of 45°; this portion of the bunker being 5 ft. 6 in. deep. The walls consist of 5 in. slabs, extending on two sides to the top of the bunker. At either end spaces are left in the bunker wall, 7 ft. 7½ in. wide by 6 ft. 9 in. deep, through which an overhead track passes.

The opening in the mouth of the bunker is 3 ft. 6 in. square; and at this point the sloping slabs are stiffened by trimmer beams, 6 in. by 6 in. section. The sloping sides are tied to the columns at a height of approximately 13 ft. 6 in. from the footing level; and at this point a beam, 12 in. by 12 in. section, runs round all four sides of the hopper. A further beam is formed to stiffen the bunker walls 7 ft. 3 in. from the top; and a tie of similar dimensions extends across the centre of the bunker. These beams carry the track through the bunker. The bottom slabs are 5 in. thick, and the walls 4 in. thick.

When the track through the bunker is not working, the timbers which form the track can be lifted and inserted in channels let into the concrete at the sides of the openings, thereby completing the side walls, and permitting the bunker to be filled at the top.

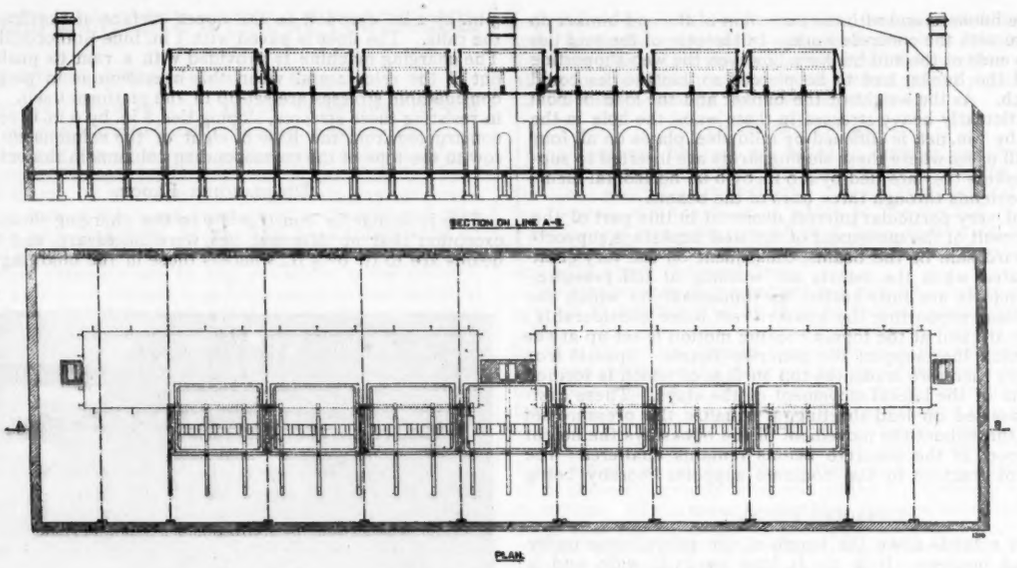


FIG. 4.—DETAILS OF THE OVERHEAD BUNKERS.

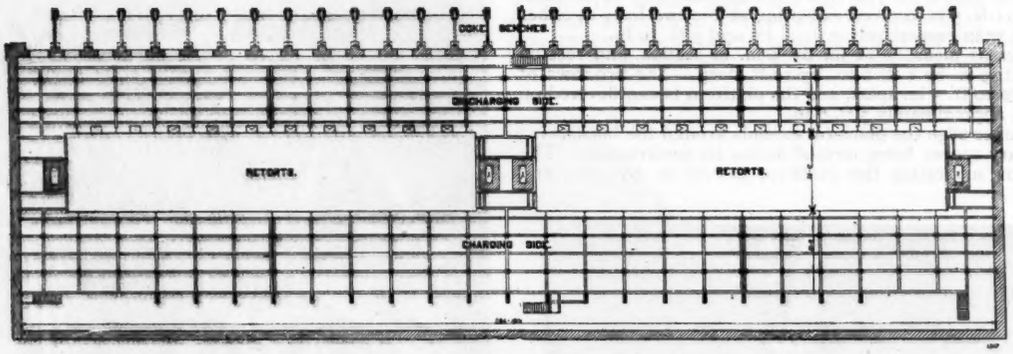


FIG. 5.—DETAILS OF THE CHARGING AND DISCHARGING FLOORS.

Fifty-Ton Coke-Hoppers.

There are two of these hoppers, each of which measures in plan 25 ft. 6 in. by 14 ft. 6 in. overall; the depth of the hoppers themselves being approximately 15 ft. They are supported on four columns, 15 in. square in section, extending to a point 4 ft. 6 in. below the ground level. The columns rest on footings 7 ft. by 5 ft. in plan, and 2 ft. deep. Four telpher stanchion bases are constructed monolithic with these footings to support the track. These bases are 5 ft. 9 in. in height by 3 ft. square at the base, tapering to 2 ft. square at the top.

Each bunker is provided with two hopper bottoms, the sides of which slope at an angle of approximately 55°, and are composed of 5 in. slabs. The openings are 20 in. square, stiffened by a trimmer beam 8 in. square in section. At the junction of the sloping bottoms and the bunker walls a beam, 15 in. by 12 in. in section, runs round all four sides of the hoppers and across the centre between the two hopper bottoms. A further beam stiffens the walls at the top level, 9 in. by 9 in. in section; and a 9 in. square tie extends from centre to centre of the side wall beams. Vertical wall beams are inserted to stiffen the side walls immediately over the division of the hopper bottoms. The sloping bottoms of all coke-hoppers are paved with blue bricks.

Mr. Rutter was responsible for the design of all the reconstruction work and machinery. The contractors for the whole of the reinforced concrete work were the Broadway Construction Company, Ltd., of Queen Anne's Chambers, Westminster. The design for the reinforcement, together with the reinforcing steel, which consisted of indented bars, was supplied by the Indented Bar and Concrete Engineering Company, Ltd.

ILLINOIS UTILITY INFORMATION COMMITTEE.

The campaign of the Illinois Committee on Public Utility Information, to cultivate goodwill, has been in operation two years; and during this time it has passed the 5 million mark in pieces of specially-prepared literature distributed deliberately, and usefully. To use its own words, the purpose of the Committee from its inception has been to conduct a systematic campaign for informing the public on the fundamentals, and particularly the economics, of the public utility industry, and thereby endeavour to cultivate a public opinion more friendly both to the industry and to the individual electric, gas, or other utility company. Newspapers are mainly relied upon; but there has also been developed systematic utilization of other agencies, including public speakers and the public schools. A weekly news bulletin goes regularly to the 900 newspapers in the State; and, in addition, special bulletins go to the dailies and press associations when news warrants it. This news service is intended to be informative rather than argumentative, and to circulate matter that is at once helpful to the utility undertakings and interesting enough to be printed for its own sake. Use of this matter by the State press amounts to considerably more than 250 newspaper columns per month, or over 3000 columns a year. Speakers' bulletins have been issued, each devoted to some phase of the utility industry. Again, a bureau is operated to find engagements before clubs, civic associations, and so on, for dependable speakers on utility subjects. More than 800 Illinois high schools use specially prepared utility industry literature in class rooms, in theme work, and in debating societies. This literature is wholly informative, not one-sided propaganda, and is sent to high-school principals and teachers only on request. Two important factors in the Committee's success are declared to have been: (1) The careful way in which its work is done, so that no accusation may lie against it of trying to mislead the public. (2) The motive power supplied by the weekly meetings of the Committee and the facilities given to Committee members for getting close to local managers and spurring them to co-operative action. It has been found that really effective cultivation of public goodwill, as distinguished from superficial scratching of the surface, is a tougher task than it looks to be from the outside.

British Engineers' Association.—The annual general meeting of the Association took place at No. 32, Victoria Street, S.W., on Thursday, May 12. At a meeting of the Council of the Association which followed, Mr. Nevile Gwynne (late Chairman of the Executive Committee) was elected President, in place of the retiring President, Colonel O. C. Armstrong, D.S.O., who had occupied the position for three years, and to whom a hearty vote of thanks was accorded. Mr. E. W. Petter was elected Chairman of the Executive Committee, in succession to Mr. Gwynne.

INSTITUTION OF GAS ENGINEERS.

Annual Report of the Council.

The Council of the Institution of Gas Engineers have issued to the members their report on the present position of the Institution and its work during the presidential year 1920-21.

MEMBERSHIP.

At the close of the year 1920 the total membership was 904, as compared with 879 the previous year.

PERSONAL.

His Majesty has conferred the Order of the British Empire in recognition of services during the war on Dr. F. Mollwo Perkin, Ph.D., F.I.C. (hon. member), who has received a Commandership, and on Mr. Percival J. Channon (associate member), who has been made an Officer of the Order.

The Rt. Hon. Lord Moulton, G.C.B., F.R.S., not long before his lamented death, was elected an honorary member of the Institution of Civil Engineers.

Sir Arthur M. Duckham, K.C.B. (hon. member), has had conferred upon him, by the President of the French Republic, the Cross of the Legion of Honour, in acknowledgment of his services to the Republic during the war.

Mr. Thomas Goulden, President, has been elected an Honorary Member of the Société Technique de l'Industrie du Gaz en France and of the American Gas Association.

Councillor Thomas Duxbury (hon. member) has been elected Mayor of his native town of Darwen; and Mr. Albert Cliff (member of the Joint Committee on Refractory Materials Research) has, for the second year in succession, been elected Mayor of Stamford.

The members of the Institution generally will share the pleasure which the Council feel in tendering to Mr. Samuel Glover, President for the year 1918-19, their cordial congratulations on his having attained, on May 1, 1921, fifty years' continuous service in the St. Helens Corporation Gas Department and the old St. Helens Gas Company, which the Company purchased in 1876. As Pupil, Assistant, Deputy-Engineer, and Chief, he made his mark. During the recent stress of war conditions, Mr. Glover not only served the Institution well, but worked very hard and constantly in various Government Departments. The Council feel sure he has fully earned the admiration and respect of all his colleagues. They hope he will enjoy every happiness in his years of retirement.

The Council with sincere regret have to record the death of the following members: The Rt. Hon. Lord Moulton, Past-President; Leonard G. Barber, Cambridge; Albert R. Cawley, Cardiff; Ernest W. Drew, London; Alfred T. Harris, Market Harborough; George W. Houston, Crewe; Robert Ormiston Paterson, Cheltenham; Robert Porter, Elland; Edward Price, formerly of Hampton Wick; William Bruce Randall, Waltham Cross; John Runton, Hull; and S. Trow Smith, Malvern.

The death of Lord Moulton removes from the roll of the Institution the name of one whose memory will be always cherished and revered. The deep interest which he took in the work of the Institution is well known; and he frequently acknowledged its value in his capacity of Director-General of the Explosives Department of the Ministry of Munitions. A letter expressing the sympathy of the Société Technique de l'Industrie du Gaz en France in the loss sustained by the Institution was received.

ADOPTION OF THE TOWN OF LOOS.

The Council have made arrangements for the Institution to co-operate with other British Engineering Societies, through the British Section of the Société Ingénieurs Civils de France, in assisting in the restoration of the town of Loos, situated in the Lens mining district in the North of France.

NATIONAL GAS COUNCIL.

The four representatives of the Institution on the National Gas Council for the year have been: Sir Dugald Clerk, Mr. Thomas Goulden, Mr. Thomas Hardie, and Mr. J. D. Smith.

THE COAL POSITION.

The Emergency Committee and other Committees of the Institution are carefully watching the developments of the coal situation, in the economic aspect of which all the members of the Institution are so closely concerned. Arrangements having regard to economy in fuel in certain departments of gas-works are now under discussion; and members will be advised through the medium of the Technical Press of any recommendations which may be arrived at.

AFFILIATION.

During the year under review, the District Associations affiliated with the Institution have been represented by the following members:

Eastern Counties Association	Mr. W. W. Townsend.
Manchester District Institution	Mr. E. H. Hudson.
Midland Association	Mr. J. R. Duff.
North British Association	Mr. R. W. Cowie.
North of England Association	Mr. A. W. Branson.
Southern Association	Mr. Charles F. Botley.
Wales and Monmouthshire Institution	Mr. A. J. Bond.

GAS REGULATION ACT.

In common with kindred organizations, the Institution expresses its satisfaction that the opposition and many difficulties encountered in the endeavour to obtain a revision of the law relating to the sale of gas have at last been successfully overcome. Unremitting labour in bringing the matter to a successful issue was exerted by the President of the National Gas Council (Mr. D. Milne Watson), to whom the Council feel the acknowledgments of the whole industry are due. The Royal Assent was given to the Bill by which it became the Gas Regulation Act on Aug. 4, 1920. As has frequently been expressed, its provisions give the industry a new Charter, which will result in the further conservation of coal, and incidentally lead to the gas industry's further development, with consequent advantage to the whole community.

BOARD OF TRADE INQUIRIES RE CARBON MONOXIDE AND INCOMBUSTIBLE MATERIALS.

At the request of the National Gas Council, the Council of the Institution arranged for technical evidence to be given on behalf of the gas industry by the President, Sir Dugald Clerk, Prof. J. W. Cobb, Mr. T. F. E. Rhead, Mr. A. E. Broadberry, Mr. R. E. Gibson, and Dr. Leonard Hill.

The Committee on the Carbon Monoxide Inquiry consists of Sir William Pearce, M.P. (Chairman), Dr. T. Carnwath, D.S.O., M.B., Mr. William Doig Gibb, O.B.E., M.Inst.C.E., and Dr. T. Gray, D.Sc., Ph.D. They have been nominated to inquire whether it is necessary or desirable to prescribe any statutory limitation of the proportion of carbon monoxide which may be supplied in gas used for domestic purposes.

The Committee on Incombustibles consists of Mr. James Hunter Gray, K.C. (Chairman), Mr. W. J. Atkinson Butterfield, M.A., F.I.C., F.C.S., and Dr. C. H. Lander, D.Sc., M.Inst.M.E., A.M.Inst.C.E.; and their reference is to inquire whether it is necessary or desirable to prescribe any limitation of the proportions of incombustible constituents which may be supplied in gas.

The evidence of the Institution's witnesses was to the effect that no statutory limitations are necessary.

GAS INVESTIGATION COMMITTEE.

The Joint Committee on Gas Heating, Lighting, and Ventilation Research of the Institution of Gas Engineers and the University of Leeds has continued to act as Research Sub-Committee for the Gas Investigation Committee of the Institution. Its membership has been altered during the year by the resignation of Dr. E. W. Smith, and the appointment of Mr. Thomas Glover (Norwich) in his place. Mr. H. E. Bloor has been added as an Institution representative, and Mr. T. F. E. Rhead co-opted. An additional University representative has still to be appointed. Dr. Smith has been a member of the Committee for a long term of years, and has throughout played a very active part in its work. The Research Sub-Committee would like to place on record their regret at losing his valued co-operation.

The present constitution of the Research Sub-Committee is as follows: Chairman: Prof. Arthur Smithells, C.M.G., B.Sc., F.R.S. Representatives of the University of Leeds: Prof. J. B. Cohen, Ph.D., F.R.S., Prof. J. W. Cobb, C.B.E., B.Sc., F.I.C. (Hon. Secretary), and Mr. G. R. Thompson, B.Sc. [one vacancy]. Representatives of the Institution of Gas Engineers: Messrs. H. E. Bloor, B.Sc., John Bond, O.B.E., J. H. Brearley, M.Inst.C.E., Charles Wood, O.B.E., Thomas Glover, C.B.E., M.Inst.C.E. Mr. T. F. E. Rhead was co-opted a member of the Research Sub-Committee for the purpose and period of research work at Birmingham. Research Chemists: Mr. James W. Wood, M.Sc. (Tech.), A.I.C., on the relative efficiencies in use of different grades and compositions of gas; Dr. A. Parker, D.Sc. (Birmingham), M.Sc. (Manc.), A.I.C., on the comparative economies in production of different grades of gas. Research Assistants: Messrs. H. Kerr, A.I.C., Diploma, Fuel and Metallurgy (Leeds), F. S. Townend, B.Sc.Eng. (London), and G. B. Howarth, B.Sc. Gas Engineering (Leeds), A.I.C.

During the year the work of the Committee has been carried out, under the supervision of Prof. Cobb, in two sections; and separate reports—the fifth and sixth—are to be presented at the Institution's forthcoming meeting.

The first section is an investigation undertaken primarily by the invitation of the Recording Calorimeter Sub-Committee of the Institution into the accuracy and general reliability under working conditions of recording calorimeters, and particularly of the Simmance recording calorimeter. For this purpose, numerous and carefully chosen experiments and calculations have been necessary; and the Committee have never had greater reason to thank Mr. James W. Wood, the Research Chemist, who has been immediately responsible for the work. The results are embodied in the fifth report. It was believed that the immediate importance of the subject-matter justified the suspension for a time of the work on the relative efficiencies in use of different grades of gas; but it is the intention of the Committee to take this up again at the first opportunity.

The second section of the work this year is the investigation of the blue water-gas process, which may be regarded as complementary to the investigation of steaming in continuous vertical retorts which was carried out at Uddingston, and reported upon last year (fourth report). Dr. Parker was again in immediate charge of the investigation; and an attempt has been made to

investigate the thermal and chemical aspects of blue water-gas production as thoroughly as was practicable. The Committee appreciated the care and skill displayed by Dr. Parker and his staff, both in the making of the necessary tests, often in very difficult circumstances, and in the treatment of the results obtained, so as to make them yield the maximum amount of information. The actual control of the plant was in the hands of Mr. G. A. Bamber, Engineer of the gas-works, at Adderley Street, of the Birmingham Corporation, where the investigation was carried out.

Once more the Committee takes the opportunity of expressing its thanks to the Birmingham Corporation Gas Department and its staff for the facilities they have afforded and the help they have rendered to the progress of the investigations.

Spent Oxide and Sulphuric Acid.

Communications have been considered from the National Gas Council with reference to the report of the Council's Spent Oxide and Sulphuric Acid Committee. Technical information, suggestions, and recommendations on the subject under investigation have been forwarded by the Council of the Institution.

Special attention was called by the National Gas Council to the question of the necessity for the thorough cooling of spent oxide before it is loaded into trucks for dispatching from gas-works to the acid manufactory.

The work of the Committee was to investigate prices paid for sulphur in spent oxide by the acid manufacturers, the prices charged for sulphuric acid to gas undertakings making sulphate of ammonia, and the relationship of the price per unit of sulphur to the cost per ton of acid. In the course of other investigations, the Committee deemed it advisable to ascertain from reliable sources the actual cost and equitable selling-price at makers' works of sulphuric acid. The final report of the Committee will be published in due course.

Standard Conditions of Contract.

At the request of the Society of British Gas Industries, discussions have taken place with the Society as to the desirability of revising clause 27 applying to terms of payment. Recommendations of the Institution Council on the subject have been sent to the Society for consideration.

Institution Gas Research Fellowship.

Mr. A. C. Monkhouse, B.Sc., was elected to the Institution Gas Research Fellowship in October, 1920, and has been engaged in the investigation of the influence of various gases in determining the yield of ammonia from coal in carbonization and gasification. It is proposed to submit the results so far obtained in this investigation in the form of a joint paper, entitled the "Liberation of Nitrogen from Coal and Coke as Ammonia," by Mr. Monkhouse and Prof. Cobb to the Institution at the forthcoming meeting.

Corbet Woodall Scholarship.

Mr. Leslie P. Ingram's tenure of this scholarship will be completed at the end of the current university session; and a successor will be elected. During the session he has been occupied with the final year's work for the B.Sc. degree, and has assisted in the work carried out on an apparatus proposed for the examination of coals in the laboratory from the point of view of the carbonization industries. Mr. Ingram also assisted in the testing of the downward steaming of vertical retorts at Truro in the vacation of 1920, and has prepared a thesis thereon for degree purposes.

Institution Livesey Memorial Professorship.

The Department of Coal Gas and Fuel Industries in the University of Leeds, over which the Livesey Professor presides, has so far increased in numbers that the limit of its accomodation has been reached; and the University is faced with the alternative of extending its laboratories or of imposing more stringent selective tests to students on entry. Provision has already been made of a temporary nature in the first direction indicated.

Research work has been carried out on fuel; and most of the results have been reported to the Institution at the annual meetings. Investigations have also been made on the thermal expansion and contraction of refractory materials.

In order to meet the increasing expenses necessitated by the development in the work of the Department of Coal Gas and Fuel Industries, contributions have been made by the South Metropolitan Gas Company and the South Suburban Gas Company, through Dr. Charles Carpenter and Mr. Charles Hunt, towards increasing the endowment of the Livesey Memorial Fund, with the hope that the gas industry as a whole would sustain the effort so initiated.

Refractory Materials Joint Research Committee.

Mr. A. E. Broadberry, Chairman of the Joint Committee, reports as follows: As outlined in last year's report, the research work which the Committee has carried on since 1909 has perforce been handed over to the British Refractories Research Association, as from June 30, 1920. The new Association established under the ægis of the Department of Scientific and Industrial Research has exhibited every desire to recognize the Committee's past work, and to offer to it the highest possible status. With this object in view, a Sub-Committee on Gas Research has been formed—consisting of four members of the Association, four members of the Institution, and four members of the Society of British Gas Industries—to take charge of the gas industry's refractory research. The names of this Sub-Committee are: British Refractories Research Association: Messrs. F. H. Brooke, James Dunnachie, Sir William Jones, and Col. C. W. Thomas. The Institution of Gas Engineers: Messrs. A. E. Broadberry, Thomas Hardie, J. P. Leather, and W. E. Price. Society of British Gas Industries: Messrs. T. Allan, M. Barrett, Albert Cliff, and G. H. Pearson Perry.

The Sub-Committee has not yet met. But it is intended to be thoroughly representative of the old Committee; and while it is outside the power of the new Association to incorporate the old Committee, because it is far too large, it is quite prepared (if the Institution and Society of British Gas Industries think it is desirable that the old Committee shall continue in existence) to consider the new Sub-Committee practically as delegates from the old Committee, with the reservation that, as they are bound to secrecy in important discoveries, nothing may be divulged without the approval of the Council of the Association.

Meanwhile, the work inaugurated by the Joint Committee is being continued; and proof of the cordial regard for the Joint Committee's work is supplied in the fact that three reports on subjects introduced by it into the research work have been released for publication at the Institution's forthcoming annual meeting. If the Joint Committee is continued in office, its functions will be to consider and advise on the desirable lines of development of the research on gas refractories from the industry's point of view; and it would be for the Sub-Committee of the British Refractories Research Association to promote the subsequent action.

There seems to be the possibility of some redundancy in the continued existence of the old Committee, though there can hardly be any overlapping, as the old Committee will have no power or authority. It must be borne in mind that expense may be involved in continuing the Committee; and at present the funds available are represented by an adverse balance of £33 10s. 4d., because the Department of Scientific and Industrial Research required a refund of £116 9s. 8d. after the research had been taken over by the British Refractories Research Association. The Committee feels it is scarcely justified in continuing its existence; for though the work is of great interest, the Committee has no authority, and but little responsibility. One, or at most two, perfunctory meetings each year are all that are likely to be held.

The Institution has become a member of the British Refractories Research Association. Mr. A. E. Broadberry and Mr. W. E. Price have been appointed as the Institution's representatives on the Council of the Association.

The Council, after considering Mr. Broadberry's report, decided that, in the interests of the research as to gas refractories, it was desirable to continue the existence of the old Joint Committee. It consists of the following: Representing the Institution: Mr. A. E. Broadberry (Chairman), Prof. John W. Cobb, Dr. H. G. Colman, Messrs. Samuel Glover, Thomas Goulden, Thomas Hardie, Dr. J. A. Harker, Messrs. Stanley H. Jones, J. P. Leather, W. S. Morland, F. Prentice, W. E. Price, H. E. Riley, S. Y. Shoubridge, W. W. Townsend, and Lieut.-Col. H. W. Woodall. Representing the Society of British Gas Industries: Messrs. T. Allan, M. Barrett, C. Brooks, Albert Cliff, G. V. Evers, C. Fagan, G. H. Pearson Perry, and Col. C. W. Thomas.

The Council regret that, in consequence of his removal to Newcastle-on-Tyne, Major F. J. Bywater has had to tender his resignation as Hon. Secretary of the Committee. They wish to record the sense of their appreciation of the services he has rendered since he first became connected with the work of the Committee. This work originated in the paper which he gave to the Institution on June 18, 1908, on "Refractory Materials." Members of the Institution will unite with the Council in offering their congratulations to Major Bywater on his military services in the Royal Engineers during the war, and on the decoration of the Military Cross which was conferred upon him. Mr. Leather has succeeded to the Hon. Secretaryship of the Committee.

National Illumination Committee of Great Britain (affiliated to the International Commission on Illumination).

The report of the Chairman [Major Kenelm Edgcumbe, R.E. (T.)] of this Committee, with which the Institution is affiliated, is appended to the Council's report—see p. 434.

Life of Gas-Meters Joint Committee.

This Committee consists of Messrs. John Bond, A. E. Broadberry, R. H. Brown, R. E. Gibson, S. Glover, F. W. Goodenough, T. Goulden, T. Hardie, A. A. Johnston, W. E. Price, R. G. Shadbolt, J. D. Smith, and Albert Stokes, representing the Institution; and Messrs. F. G. Cockey, Thos. Glover (London), A. W. Glover, W. H. Johnston, B. R. Parkinson, F. R. Smith, and F. Templer Depree, representing the Society of British Gas Industries. Mr. J. G. Taplay has continued to act as Chemist to the Committee.

During the year the Committee has been occupied upon the following subjects: Deposits on the valves of station governors, revision of the Sales of Gas Act, new standard sizes of dry meters (which have been approved and are here given, and come into operation on Jan. 1, 1922), proposed new standard sizes of wet meters, over-driving of meters and protection against suction, registering dials of meter indexes, gas-meter testing regulations, standardization of meters, and spraying of meters. Mr. Taplay, the Chemist to the Committee, is to give a paper at the Institu-

tion's forthcoming meeting on the "External Corrosion of Services and Mains."

PROPOSED NEW STANDARD SIZES OF DRY METERS.

[Comes into operation on Jan. 1, 1922.]

Number.	Capacity per Hour.	Capacity per Revolution.	Revolutions per Hour.	Bore of Connections.
	C.Ft.	C.Ft.		Inch.
1	30	0·125	240	¾
2	40	0·166	240	¾
3	60	0·25	240	¾
4	120	0·5	240	1
5	210	1·0	210	1½
6	420	2·0	210	1¾
7	540	3·0	180	2
8	720	4·0	180	2½
9	900	6 0	150	3
10	1200	8·0	150	3
11	1800	15·0	120	4
12	3000	25·0	120	5

EDUCATION OF GAS ENGINEERS.

The Committee appointed to consider a scheme for the better education of gas engineers has submitted a draft scheme to the Board of Education; and a small Joint Committee representative of the Board and the Institution has been set-up for the consideration of various details. The Institution is represented thereon by the President and Messrs. F. W. Goodenough and W. Hole. Arrangements have been made for the Junior Gas Associations to be represented in the steps which are being taken.

Pending agreement upon a scheme, the Board of Education have agreed to the temporary resumption of examinations by the City and Guilds of London Department of Technology in the lower grades of "Gas Engineering" and of "Gas Supply." Application is to be made for the revival also of the lower grade examination in "Gas-Fitting."

CITY AND GUILDS OF LONDON EXAMINATIONS.

Suggestions of the City and Guilds of London Examiner in "Gas-Fitting" (Mr. R. J. Rogers), as to the desirability of revising the methods of carrying-out the practical examinations in "Gas-Fitting" were considered by the Emergency Committee, with Mr. Rogers and Mr. Charles Hawkins, Superintendent of the Department of Technology of the City and Guilds of London Institute. It was decided to suggest alterations in the method of these examinations for 1922 and subsequently. They are set forth in the following communication received from Mr. Rogers:

The existing regulations for the final examination state that each candidate will be required to furnish a certificate signed by his employer, stating that he has been engaged for not less than two years in the practice of gas-fitting, and that he is considered to be a fair workman. The Examiner is anxious to ensure that a final certificate in "Gas-Fitting" shall not be granted to a candidate who is less than 21 years of age; and it is generally considered in the industry that a man cannot obtain experience in the various sections of his trade until he has reached this age. Furthermore it is necessary, in the Examiner's opinion, that before a certificate is granted, the candidate should have carried out work on the district himself for at least two years, and not simply acted as an assistant to another gas-fitter. It is, however, necessary, the Examiner thinks, that the gas-fitter to whom the City and Guilds of London Institute certificate is awarded should have received good district experience. It is therefore necessary that the employer should state the precise occupation of the candidate, to ensure that the certificate is not granted to a gas-fitter who has not had any district experience—such as the fitting-up of domestic appliances under varying conditions found on the district, but who may possibly have been engaged as a gas-fitter or a pipe-fitter in a works. The Examiner is anxious that another year he may be able to make a more complete practical test of the candidate, if necessary, in the workshops; and the views of the Local Examiners will be sought on the point. In regard to Grade 2 examination, it is suggested that preliminary steps be taken by the Institution of Gas Engineers to ensure that Grade 2 in "Gas-Fitting" examinations may be arranged for the year 1922. If this can be done, the Examiner suggests that the certificate of the candidate should show that he had been engaged in the practice of gas-fitting for not less than two years, instead of one year, as now stated in the syllabus.

[The proposed certificate is set out in the Council's report.]

BRITISH ENGINEERING STANDARDS ASSOCIATION.

The Council have to report that they have elected Dr. Charles Carpenter and Mr. Thomas Hardie as the Institution's representatives on the Sectional Committee on Pipe Flanges. Mr. Hardie succeeds Mr. Charles Hunt, who has retired. The Council desire to record their appreciation of the work which Mr. Hunt has carried out while serving the Institution on the Sectional Committee.

Mr. John Terrace was appointed to represent the Institution at a conference to consider the desirability of setting-up a Committee to undertake the standardization of plant and apparatus employed in the chemical industry.

The recommendations of the conference were brought before the Main Committee of the Association, with the result that a Sectional Committee on Chemical Engineering has been sanctioned; and Sir Arthur Duckham was appointed Chairman.

Mr. Terrace reports that representatives of the following have been appointed on the Sectional Committee: Admiralty, War Office, Chemical Warfare Section of the War Office, Air Ministry, General Post Office, National Physical Laboratory, Government Laboratory, Society of Chemical Industry (Chemical Engineering Section), Institute of Chemistry of Great Britain and Ireland, Chemical Society, Association of British Chemical Plant Manufacturers, Society of British Gas Industries, Institution of Gas Engineers, Institute of Metals, Faraday Society, Iron and Steel Institute, National Federation of Associated, Paint, Colour, and Varnish Manufacturers of the United Kingdom, Association of British Chemical Manufacturers, Institution of Petroleum Technologists, Ceramic Society, Oil and Colour Chemists' Association, National Benzole Association, and Society of Dyers and Colorists.

Mr. Alexander Wilson, the Institution's representative on the Sectional Committee on Pipe-Threads, reports that since the meetings with the American representatives regarding an International Standard for Pipe-Threads at which no agreement could be arrived at, there has been nothing further to report regarding adjusting an international standard. The Sub-Committee has, however, dealt with minor details in connection with the British Standards; but no really important work as affecting the interests of the gas industry requires to be reported for the past year.

INSTITUTION OF CIVIL ENGINEERS.

Communications have been received from the Council of the parent Institution intimating that they do not intend to proceed with the Bill proposed by them last year to provide for the registration of engineers, and that they have decided to apply for a Supplemental Royal Charter to authorize the use of the professional description "Chartered Civil Engineer" by corporate members of the Institution.

KELVIN GOLD MEDAL.

The Council of the Institution was invited to attend the meeting for the presentation of the Kelvin Medal to Dr. W. Cawthorne Unwin, F.R.S. The ceremony was performed by the Rt. Hon. A. J. Balfour, F.R.S., O.M., Lord-President of the Council of the Institution of Civil Engineers, on May 4.

The Kelvin medal was founded in 1914 principally by British and American engineers, to commemorate the achievements of Lord Kelvin in those branches of science which are specially applicable to engineering. The award is dealt with by a Committee of the Presidents of the representative British engineering institutions, after their consideration of recommendations received from similar bodies in all parts of the world; and, in accordance with the terms of the trust, it is made to the person whom the Committee finds to be most worthy to receive this recognition of pre-eminence in the branches of engineering with which Lord Kelvin's scientific work and research were identified.

It is interesting to recall that Dr. Unwin, the first recipient of the Kelvin medal, read a paper on the "Flow of Gas in Mains and Distribution at High Pressure" before the Institution of Gas Engineers in 1904, for which he was awarded the "London" gold medal, the gift of Mr. Harry E. Jones, Past-President.

TEMPORARY OFFICES.

The thanks of the Institution are due to the Governor and Directors of the Gas Light and Coke Company for having provided office accommodation at Monck Street, Horseferry Road, until the new offices at Grosvenor Gardens are available.

LIBRARY.

The Library is at present dismantled, and its contents stored in the temporary offices in the premises of the Gas Light and Coke Company; but on moving to the new premises in Grosvenor Gardens, it is hoped that it will be re-established as an up-to-date library of books of reference, some of which will be available for loan to members of the Institution. These books will be specially useful to students of the Institution, of whom there are an increasing number every year.

The donations received during the year are enumerated in an appendix to the report. The Council expresses its acknowledgments to those who have so kindly presented these books and publications; and further gifts to aid in developing this branch of the Institution's work will be warmly welcomed.

SECRETARYSHIP.

The Council is glad of this opportunity of offering on behalf of the Institution its congratulations to Mr. Dunn on his attainment of 25 years in the service of the Gas Institute and the present Institution of Gas Engineers. He was elected Secretary of the former body in 1896, and of the amalgamated body on its incorporation in 1902. His predecessors in the British Association of Gas Managers and the Gas Institute were the late Mr. James Blackburn, the late Mr. W. H. Bennett, Mr. W. H. Harvey, and the late Mr. F. G. Burfield.

The membership of the Gas Institute in 1896 was 627; in 1921, with the list of candidates who are up for election this year, the membership of the Institution will approach a total of 1000. The receipts and expenditure respectively for the former year were £815 12s. 3d., and £742 18s. 3d.; and for 1920 (including the special purposes fund, but not taking into account the proportion of the publicity and special purposes fund handed over to the "B.C.G.A.") £5037 18s. and £6184 11s. 4d.

It is interesting to note that the figures of the benevolent fund, of which Mr. Dunn is Joint Honorary Secretary with Mr. Price, have also grown. The receipts and expenditure respectively in 1896 were £201 6s. 2d. and £43 17s. 7d.; in 1920, the amounts

were £460 9s. 3d. receipts, and £306 17s. 1d. expenditure. The number of subscribers in 1896 was 86; and in 1920 it had risen to 363.

The Waterways Association.

This Association, in the objects of which the Institution is interested, regrets to report that, from the beginning of the year 1920, the prospects of the development of the inland waterway system, so that it might take its proper place in the transport economy of the country, have not improved. On the other hand, the interests of inland water-borne traffic were seriously prejudiced by the action of the Government in withdrawing the subsidy, both from canal carriers and canal owners, before State assistance was withdrawn from railways, thus leaving the weaker branch of our transport service without aid in competing with the stronger, while the latter was still backed by Government guarantee. During the year the Committee appointed by the Ministry of Transport, presided over by Mr. Neville Chamberlain, M.P., has been pursuing inquiries into the possibility of developing the canals—if not to the full extent recommended by the Royal Commission in 1919, at any rate to a limited degree, commencing with those routes where the greatest result can be secured with the least expenditure—and its report is expected at an early date. The Waterways Association arranged for several of its members to tender evidence; and it is hoped that some results may follow as soon as the finances of the country offer any prospect for expenditure in this necessary, but long-delayed, development of transport facilities.

The Engineers' Club.

The Institution having been invited to join in the movement for the formation of an Engineers' Club with premises in London, the Council appointed the President to represent the Institution; and he has been nominated a member of the Provisional Committee. Already more than a thousand engineers have signified their intention of joining. Particulars can be obtained of Mr. Edmund Hill, at No. 39, St. James' Street, London, S.W. 1.

Accounts.

Appended to the report are the accounts for the year ended Dec. 30, 1920, duly certified by the appointed Auditors, Mr. S. Y. Shoubridge and Messrs. Wood, Drew, & Co. As in future the subscriptions for the British Commercial Gas Association are to be paid to the National Gas Council, the Institution's publicity and special purposes fund has been closed as from March 31 last, and the balance handed over to the Association.

The Council regret that the death of Mr. Ernest W. Drew (who supervised the annual audits for many years) has to be recorded.

Thomas Goulden, *President.*
W. E. Price, *Hon. Secretary.*
Walter T. Dunn, *Secretary.*

APPENDIX.

The National Illumination Committee of Great Britain.

(*Affiliated to the International Commission on Illumination.*)

Chairman's Report for the Year 1920.

Gentlemen,—The last special annual meeting of the National Illumination Committee was held in January, 1916, on which occasion the late Mr. W. Duddell presented his report as Chairman for the year 1915. It may therefore be well to refer to the years 1916-17-18-19.

In November, 1917, the National Illumination Committee suffered an irreparable loss by the death of Mr. W. Duddell (elected Chairman in October, 1915)—a loss shared by the entire scientific world.

On the technical side there is, unfortunately, little to record during the years 1916-17-18, since, though many members of the Committee were doing valuable work in connection with illumination matters, it was chiefly at the request of one or other of the Government Departments, and in their individual capacity rather than as members of the National Illumination Committee. For this reason, only one meeting was held during the years in question.

In May, 1919, Mr. A. P. Trotter was elected Chairman, with Mr. J. Bond and Major K. Edgcumbe as Vice-Chairmen. Sub-Committees were at the same time appointed to deal with various questions, particularly in connection with standards and definitions.

To the extreme regret of the Committee, Mr. A. P. Trotter, having left London, felt himself compelled to resign the chairmanship; and in June, 1920, Major K. Edgcumbe was elected Chairman, with Mr. J. Bond and Mr. C. C. Paterson as Vice-Chairmen, Mr. W. J. A. Butterfield as Hon. Treasurer, and Mr. H. T. Harrison as Hon. Secretary.

Owing to the suspension of the activities of both the National Committtee and the International Committee during the war period, no contributions have recently been called for from the constituent societies; but the latter have now been notified that it will probably be necessary to make a call upon them in view of the proposal to hold a meeting of the Commission in Paris during the coming year.

During the year 1920 the main Committee and its Sub-Committees have continued their work, among which may be mentioned the following.

Arrangements have been made with the Gas Referees for the transfer to the National Physical Laboratory, for safe keeping and ease of reference, of the specification and drawings covering the construction and method of use of the standard Vernon-Harcourt pentane lamp.

A statement has been prepared embodying the corrections for humidity and air pressure to be applied to the standard Vernon-Harcourt lamp. This statement is being referred to the Societies constituting the National Illumination Committee—namely, the Institution of Gas Engineers, the Institution of Electrical Engineers, and the Illuminating Engineering Society—with a recommendation for its adoption.

The National Committee having been asked by the International Commission for any proposals it wished to bring forward, has given notice of its intention to propose at the next meeting of the Commission the adoption by the Commission as the international unit of candle power of the unit defined in 1909 by the following laboratories, and subsequently preserved by them—viz., the Laboratoire Central d'Electricité of Paris, the National Physical Laboratory of London, and the Bureau of Standards of Washington.

A large number of meetings of the Main Committee and of a Sub-Committee have been devoted to drawing-up a set of terms and definitions covering the fundamental quantities involved in illumination problems. The subject is a difficult one; but considerable progress has been made, and it is hoped that these terms and definitions will tend to clarify the conceptions involved in such problems, and may further serve as a basis for that international agreement which is recognized on all sides as so eminently desirable.

In conclusion, the thanks of the Committee are due to the various Societies who have allowed it to hold meetings in their buildings, and notably to the Institution of Gas Engineers and the Illuminating Engineering Society.

(Signed) Kenelm Edgcumbe,
Major R.E. (T.), *Chairman.*

Feb. 19, 1921.

THE BENEVOLENT FUND.

The Committee of Management have pleasure in reporting that the income of the fund for the year ended Dec. 31, 1920, amounted to £460 9s. 3d., of which £253 8s. was derived from annual subscriptions, £80 15s. 3d. from donations, £87 2s. 4d. from interest on investments, £7 7s. 6d. from interest on bank deposit account, and £31 16s. 2d. from refund of income-tax.

The expenditure for the same period was £306 17s. 1d., made up of £271 18s. in grants to widows, orphans, and members, £30 7s. 4d. for printing and stationery, and £4 11s. 9d. for postages, receipt stamps, &c.

After deducting the amount received for donations, which are regarded as for purposes of investment as far as may be possible, there was an excess of income over expenditure for the year of only £72 16s. 11d., a small amount to have in hand for meeting any sudden calls on the resources of the fund that may arise. The contributions of those members of the Institution who do not already subscribe are therefore needed to provide adequate support for the future requirements of the fund in affording relief to the necessitous. It may here be added that there were 363 subscribers last year, and that the membership of the Institution totalled 904.

During the year, Mr. T. Thornton, of Rowley Regis, has become a member of the Committee of Management on his election as Hon. Secretary of the Midland Association of Gas Engineers and Managers, in succession to Mr. W. G. S. Cranmer; and also Mr. David Fulton, of Helensburgh, on his election as Hon. Secretary of the North British Association of Gas Managers, in succession to Mr. P. B. Watson, of Glasgow.

The two members retiring in order of rotation at the forthcoming annual meeting are Mr. W. B. Farquhar, of Ilford, and Mr. W. W. Woodward, of Salford. As their successors, the Committee have nominated for election Mr. H. E. Bloor, of York, and Mr. Frank Prentice, of Ipswich.

Obviating Stream Pollution.

At a joint meeting of the Gas Associations of Pennsylvania and New Jersey, Mr. Francis E. Daniels, the Assistant Engineer of the Pennsylvania Department of Health, dealt with the subject of stream pollution, and acknowledged the good work in preventing this which has been done by the United Gas Improvement Company, the American Gas Company, and the Rainey-Wood Coke Company. He said it had been found that waste from the gas-works along the Schuylkill River gave an objectionable taste even when diluted with 10 million parts of water. Mr. Bains explained in detail to the meeting what the Reading Gas Company did to prevent stream pollution, which had killed from 20,000 to 30,000 young fish in the river named. At first it was thought that, if the oil and tar were removed from the waste, the problem would be solved; but this was found not to be the case. The quantity of water turned into the stream was from 3000 to 5000 gallons a day. In the summer it gave off no odour; but during the winter months it imparted to the water a bad taste and smell. The clean water was kept separate, and the contaminated water treated and used in the boilers; the problem being in this way solved. The treatment consisted of running the water into a relief holder tank, where treatment of ½ lb. of copperas to 1000 gallons of water was allowed to drip into the contaminated water, after which it went into another tank, where it was treated with caustic soda, and then through a sand filter to remove the loose solids. The small amount of phenol and naphthalene that goes into the boiler is of no consequence, as it constitutes only a trace—the light oils having been recovered. The question of the cost of the process did not really enter into the matter, as it was of primary importance to prevent the water from going into the stream. The cost of sand and cleaning the filters would, however, average about a dollar per day.

REFRACTORY MATERIALS SECTION OF THE CERAMIC SOCIETY.

A Joint Meeting of the Refractory Materials Section of the Ceramic Society with the Syndicat des Fabricants de Produits Céramiques de France was held in Paris on the 14th inst. The French Society afterwards entertained their British visitors to a banquet at the Hôtel Palais d'Orsay.

RESISTANCE TESTS AT DIFFERENT TEMPERATURES.

The first of the four papers contributed was by Captain V. Bodin, on "Resistance Tests on Refractory Products under Load at Different Temperatures." By means of special apparatus described in the paper, the author obtained a series of curves, from which the crushing load could be determined. From the results, the following conclusions were deduced.

(1) Most refractory products (and especially those consisting essentially of silica and alumina, or of silica only) tend to show diminution of resistance to load as the temperature rises; and a minimum resistance is generally reached at about 800° C.

(2) At higher temperatures the same products show rapidly increasing resistance, up to a maximum, usually about 1000° C. For certain clays, this maximum may be four times the minimum, or even more.

(3) With still further heating, all refractory products show a progressive decline in resistance, and this tends towards zero at about 1600° C.

(4) Refractory products generally tend to become plastic, or semi-plastic, above 1200° C.

The existence of a minimum load possesses great importance from a practical point of view, since all the refractory masonry of a furnace passes through the range of temperature corresponding to minimum resistance during both the heating-up and cooling-down. This might, of course, develop trouble of which the cause has not been known hitherto. It is also noteworthy that, though it has not been found possible to change the fusing temperature of a refractory brick by varying the size of grog, compactness, &c., this means may probably be employed to increase the minimum resistance, in which case the quality of the brick would be improved. Captain Bodin found the refractory properties of bauxite to be apparently improved by raising the firing temperature, as Le Châtelier had previously found in the case of clay. The maximum resistance has not the same importance practically as the minimum. However, if refractory materials could be chosen so that their working temperature should coincide with their maximum resistance (which differs for different products), the working conditions would then be very favourable for durability.

Refractory products are mostly used at temperatures exceeding those at which they become plastic; but as only one surface is exposed to the high temperature, and as the refractories do not conduct heat freely, the greater part of the brick retains sufficient strength to support the superstructure.

DINAS BRICKS OF CONSTANT VOLUME.

A preliminary note by M. Rebuffat is entitled "Dinas Bricks of Constant Volume." The author discovered that certain quartzites used for making good silica bricks contain quite appreciable proportions (0·31 p.ct.) of phosphoric anhydride. He also found by actual trial that an otherwise unsuitable quartzite could be made to produce good bricks by the addition of a small amount of phosphoric anhydride. Phosphoric acid occurs widely distributed in various natural rocks, so the author feels justified in suggesting that quartzites which give bricks of constant volume (that is, good silica bricks) probably owe their special properties to the presence of small quantities of phosphoric acid. He found that tridymite was mainly formed under conditions mentioned, and that even after heating for 24 hours at 1300° to 1350° C., the specific gravity remains at 2·22 to 2·27.

PYROMETER INSTALLATIONS.

In Mr. R. S. Whipple's paper on "Difficulties Experienced in Maintaining a Pyrometer Installation in a Works," the author expresses the opinion that want of success of any pyrometer installation may result in nearly every case from (*a*) installing the wrong type of instrument, (*b*) not using the instrument efficiently, or (*c*) the instrument itself requiring adjustment or correction. These several possible causes are carefully considered in detail, and also the best means for avoiding the difficulties.

As a guide to the selection of the type most generally suitable for industrial purposes, the following suggestions were offered: For temperatures ranging from — 200° to 700° C., the resistance thermometer; 0° to 1200° C., the thermo-electric thermometer; and 700° to 2000° C. (or upwards), the optical, or the radiation pyrometer. From this it will be seen that the various types overlap, so that there is a considerable amount of selection. Resistance thermometers may be arranged to give an open scale throughout the whole of their temperature range, and are particularly valuable as standards of reference. Thermo-electric thermometers are being largely used, and owing to the various improvements that have been introduced during the last few years, have become instruments of precision, even in the workshop. Both the optical and radiation pyrometers have the great advantage that it is not necessary to insert them into the source of heat; so that assuming various precautions are taken, the temperature of a hot body can be measured either by the luminosity of the hot body, or by the radiation emitted by it.

As a general rule it may be stated that in workshops for the measurement of temperatures between 300° and 1200° C. the thermo-electric thermometer should be used; while for work requiring high accuracy at temperatures between 800° and 1200° C. thermo-couples made of metals of the platinum group should be employed. Experience has shown that the platinum—platinum-rhodium couple is the most satisfactory, and may be used for short periods for temperatures as high as 1600° C. It is almost impossible to protect a couple from deleterious gases at this high temperature; and therefore it is inadvisable to use it for any length of time above 1200° C. The high price of platinum almost renders the platinum—platinum-rhodium couple an unobtainable luxury; and the base-metal couple is largely taking its place. The base-metal couples in general use are the iron—constantan and the nickel-chromium—nickel-aluminium, capable of being used up to 1370° C.

If it is wished to record continuously above 1000° C., then a radiation pyrometer should be used. Direct readings may be taken by means of a radiation or an optical pyrometer. If the hot body is small, then an optical pyrometer must be employed. When making a decision it must be borne in mind that the particular type of instrument has certain limitations. In any case it is asking a great deal to insist on an accuracy of 0·1 p.ct.—*i.e.*, 1° C. at 1000° C.—and an accuracy of this type can only be obtained by taking special precautions. Assuming that the most satisfactory type of instrument has been selected, a great step has been taken towards the efficiency of the installation.

In conclusion, he urged once again that the only way to maintain a successful pyrometer installation is to make it definitely someone's business to look after the instruments. A little care daily will, not improbably, keep an installation in running order. Persuade the fireman or toolmaker that the instruments have been installed to help him turn out good work, and he will do his best to take care of the pyrometers in the furnace. Tell him that if he has had the misfortune to knock the couple, either when putting it in or out, or when it is in position, to let you know at once. In pyrometry, as in other matters in life, "A stitch in time may save nine," and the substitution of a new porcelain or quartz sheath for a broken one will not improbably save the thermo-couple and a good deal of worry, if not money.

Keep the leads and switches between the pyrometer and indicator or recorder clean, and in good order. In the case of these instruments, take every precaution to protect them from overheating and dust. Having done so, there should be little trouble with the pyrometer installation. Too much, however, must not be expected from the installation. It seems unnecessary to expect to read an instrument to one or two degrees when the temperature of the furnace which is being recorded cannot be controlled to within ten or twenty degrees.

As in all machine-tool operations, high accuracy can only be obtained by care; and it is always wise to determine the accuracy required before putting in the installation. The type of instruments used and the sub-standards required, all hang upon this decision, which in the majority of cases can be based upon the experience gained by other workers. In many cases the pyrometer manufacturer may be able to advise from his experience gained on similar problems.

AMERICAN PRACTICE.

The final paper, by Mr. W. J. Rees, entitled "Notes on American Practice in Refractories," refers to many interesting points. The outstanding feature of American practice is the well-developed organization of plant for production at minimum cost. Mechanical methods for handling the raw materials and conveying prepared brickmaking batches to the brickmakers are general, and the elimination of hand labour is a marked feature of the larger plants.

The Medina quartzites of Central Pennsylvania probably supply more than half the raw material for American silica bricks. The Baraboo quartzites of Wisconsin and the quartzites of Alabama are the next most important sources. Each of these quartzites contains 97 to 98 p.ct. of silica, with about 1 p.ct. each of alumina and ferric oxide.

The succession in a typical large plant consists of hopper wagons with lump stone, gyratory crusher, rotary screen, bucket elevator, jaw crusher, belt conveyor, stone bins or stone store, solid-bottom pan, elevator and belt conveyor, bins for brick batch, brickmaking tables or machines. The Refractories Manufacturers' Association have devised a new machine in which the normal operations of the hand-made process are merely translated into mechanical operations, instead of pressure being applied as in ordinary machines. The author saw two machines of this type working—one producing 1200 and the other 3000 bricks per hour. The latter machine was worked by three unskilled labourers; and the bricks made with it were indistinguishable as regards porosity, mechanical strength, &c., from the best hand-made bricks.

The choice for President of the Ceramic Society for the ensuing year has fallen on Lieut.-Col. C. W. Thomas, of Stourbridge.

Next Tuesday, May 31, at 8.15, the Illuminating and Engineering Society will discuss, after an opening by Mr. J. S. Dow, the "Use of Artificial Light as an Aid to Various Games and Sports." This will be preceded by the annual business meeting.

TAR DISTILLATION.

The current issue of the "Journal of the Society of Chemical Industry" contains an abstract of a paper read at a recent meeting of the Glasgow Section by Mr. W. A. Walmsley, of the Glasgow Corporation Chemical Works.

The author pointed out that crude tar is difficult to distil when any ammonia water remains in it. An actual charge of 30 tons in a pot-still requires twenty-two hours for the removal of water and crude naphtha, and only six hours further to complete the distillation to pitch. Modern stills are designed to obviate this long period of distillation of water and naphtha, and at the same time to economize fuel. The vapours from the stills are passed through coils covered by crude tar in a pre-heater, whereby they are cooled and the crude tar is dehydrated. A further development of this principle is found in the continuous tar-distillation plant. Incoming tar is gradually warmed by meeting outgoing vapours, and in passing through a series of stills is stripped of fraction after fraction, until pitch only is left. The system is not elastic enough in its present form.

Dehydration by pumping crude tar through heated coils and releasing suddenly to atmospheric pressure, is being successfully accomplished; and the same system is used in working-up crude oils to recover the naphtha—the latter product being liberated on expansion.

The manufacture of caustic soda for phenol recovery is an essential process; and for its preparation on a large scale a continuous system is adopted. The settling of precipitated calcium carbonate is accelerated by gently moving paddles; and the sludge is continuously dried ready for recalcination on a revolving filter, if this is commercially justifiable. Little power is required in mixing the oils with caustic soda solution when the agitation is done by creating a vortex, and breaking the surface by shallow baffles.

In rectifying naphthas, a very good column is one in which the vapours travel in a downward direction in each section, and are subjected to the scrubbing action of descending condensate.

The entire works and individual plants should be designed to provide a continuous flow of products in one direction—effluents also tending in one direction.

THE CLAIRTON COKE PLANT.

A general description of the Clairton coke-oven plant of the Carnegie Steel Company, in connection with a visit paid by the members of the Engineers Society of Western Pennsylvania, has appeared in "Blast Furnace and Steel Plant."

In an abstract, the "Technical Review" says that the coal used comes from Klondyke (Fayette County), the mines being 30 to 55 miles from Clairton; and water transport is employed. The coal averages 34·04 p.ct. of volatile matter, 57·26 p.ct. of fixed carbon, 8·70 p.ct. of ash, and has a heating value of 13,157 B.Th.U. The coal is unloaded by mechanical means, screened, and crushed if it will not pass a 2½-in. screen. Belt conveyors then take it to four bunkers over the coke-ovens, each having a capacity of 4000 tons. The ovens are of the Koppers type, each of 13·4 tons capacity, and are arranged in twelve batteries. The average time for working a charge is 18 to 19 hours. The daily consumption of coal is 12,500 tons; and the products include 8165 tons of metallurgical coke, 412 tons of domestic coke, 779 tons of coke dust, 136,200 gallons of tar, 321,350 lbs. of ammonium sulphate, 38,900 gallons of light oils, 1280 lbs. of naphthalene, and 78,700,000 c.ft. of gas of 570 B.Th.U. About 90 p.ct. of the tar and water vapour is condensed and collected in the mains, and a further 8 p.ct. in coolers, where the gas is brought into direct contact with the water. The ammonia is removed by washing with 5 p.ct. sulphuric acid, and the light oils by washing the gas with petroleum, from which they are recovered by distillation, and then split into their components by fractional distillation. The residual gas is pumped by turbine-driven blowers through a 40-in. diameter pipe-line to the Duquesne and Homestead plants of the Carnegie Steel Company, nine miles away.

The Whitened Cube as a Precision Integrating Photometer.—Referring to a paper by Mr. H. Buckley, B.Sc., in the "Journal of the Institution of Electrical Engineers," the "Technical Review" says that the author indicates how a whitened cube can be made to give accurate results when used in the determination of the average candle powers of lamps having different polar distribution. As a preliminary, the relative effects of different portions of the interior of the cube in producing illumination on the window are determined, and the results used to calculate the illuminations produced by different types of light distribution. The ratios of these illuminations to that furnished by a uniform point source of unit intensity give apparent average candle powers in the cube. It is then shown by experiment that candle powers obtained by the usual methods of integrating photometry agree with these calculated values. Thus it is possible to determine by how much these apparent candle powers differ from true candle powers deduced by point-to-point methods, and hence to obtain true candle powers from experimentally determined apparent values.

CORRESPONDENCE.

[We are not responsible for opinions expressed by Correspondents.]

The Present Position of Gas Lighting.

SIR,—For a considerable period I have been investigating the possibility of obtaining by means which require only normal pressure the same velocity and volume of efflux from a burner nozzle as obtain in high-pressure gas lighting. Many years ago it may be remembered I did this by means involving mechanical movements in the lamp; but now I am eliminating all moving parts and utilizing only natural actions and effects.

Upon the completion of my technical labours, I naturally looked around to see how far financial backing could be secured for means which would enable the gas industry to dispense with special mains and compressors in attaining maximum efficiency; and, to my surprise, I was informed by a certain authority that, even with such a forward step, the position of gas as an illuminant was so far discredited by the advance of electricity that nothing in the direction I desired could be entertained.

In such circumstances I would be glad to know the opinion of yourself, or any of your readers, whether gas has so far succumbed to its rival that further improvement in its illuminating capacity is only wasted effort.

310, *Clapham Road, S.W., May* 20, 1921. C. SCOTT-SNELL.

[Two answers to the question in the last paragraph of this letter are to be found in Mr. Sandeman's communication in last week's "JOURNAL" and in an editorial article in to-day's issue.—ED. G.J.]

REGISTER OF PATENTS.

Securing Leather Diaphragms in Gas-Meters. No. 160,484.

FOX, T., of Liverpool, and ROBINSON, S., of West Derby.

No. 25,753; Oct. 21, 1919. No. 11,416; April 24, 1920.

This combined invention relates to meters of the type in which the diaphragm is usually situated within a rectangular chamber, on the base of which a circular dish is fixed; the diaphragm then attached to the top of the dish by means of a bayonet joint, so that it can be secured in position by a partial rotation of the disc, instead of having to be either soldered or secured by screws or a number of catches. The joint is diametrically opposite the pipe joint of the upper chamber. In addition, the diaphragm is secured to the dish by a wire-ring fitting in a circular groove in the periphery of the dish.

The invention further includes apparatus in which the ends of the wire ring are arranged to form three parallel overlapping elements all lying on the diaphragm. This is effected by looping one end of the wire, upturning the end of the loop, and then passing the single end through the loop to lie between the two elements of the loop. The two ends of the wire are then forced apart (say by a turnbuckle). This obviates the necessity of using a strip of metal underneath the join to make a gas-tight joint, and it also provides against the lateral movement which is liable to take place if two single ends of the wire overlap and are forced apart.

The invention also comprises the connection of the diaphragm with the pivoted bridge actuating the escapement mechanism. This consists of a bolt and nut with the addition that projections are formed on the outer diaphragm plate to prevent rotative or lateral movement of the bridge relatively to the diaphragm when the nut is tightened-up and the diaphragm has been in use for some time.

Inverted Incandescent Gas-Burners.—No. 161,673.

PODMORE, A. E., of Herne Hill, Surrey.

No. 1098; Jan. 13, 1920.

In this burner fitting the combustion air is supplied to the mixing chamber by means of pipes bent downwardly and having their lower ends connected with the gallery or globe-ring, and disposed so that the ports for admission of air to the pipes are below the level of the outlet for the products of combustion. Means are provided on a lower surface of the gallery for varying the quantity of air admitted to the pipes. The inventor's second claim is for the employment of pivoted or slidable discs or plates on the gallery or globe ring, and adjustable to cover or uncover the air ports to any desired extent. Air-control means may also consist of a ported ring mounted on the globe ring so as to be circularly adjustable for the purpose of covering or uncovering the air-ports. The burner employed may be adapted to permit the gas supply to be readily varied, as well as to allow of the ready exchange of the nozzle piece, whereby the same burner may be used with mantles of different sizes.

Bunsen Nozzles for Inverted Burners.—No. 161,834.

GOULD, F. J., and DICKENS, C., of Little Trinity Lane, E.C.

No. 10,546; April 15, 1920.

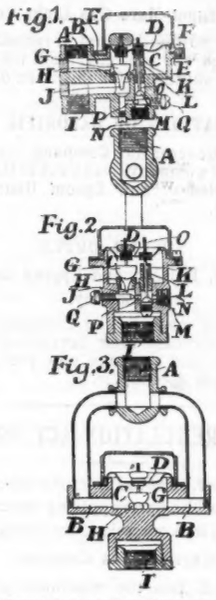
This invention relates to bunsen nozzles (for inverted incandescent gas-burners) made in two tubular parts adapted to be held together, and in the lower part of which an enlargement is made and has fitted to it a screen of wire. The upper part is formed as a venturi tube—that is to say, the bore is tapered in opposite directions, with the smaller ends of the tapered parts meeting each other. The enlargement in the lower part is large enough to form a mixing chamber.

Controlling the Lighting and Extinguishing of Gas-Burners.—No. 162,050.

WILLIAM SUGG & CO., LTD., of Westminster, and DANIELS, H. C., of Wimbledon, S.W.

No. 1599; Jan. 17, 1920.

This invention relates to apparatus in which the main gas supply and the flash light supply both pass through the same pipe (controlled by one cock) to a chamber, and in which a float or diaphragm controls a valve for the supply of gas to the burner and a flash light valve of the type shown in patents No. 5126 of 1888 and No. 13,764 of 1896.



Daniels (Sugg & Co.) Gas-Burner Controller.

The engraving shows two forms of apparatus made in accordance with the invention. Fig. 1 is a section of one apparatus and figs. 2 and 3 are sections at right angles to each other of the other form.

A in both is the main gas supply which communicates through a pipe B with a chamber C. In figs. 2 and 3, however, this supply is bifurcated and communicates with the chamber C through two passages B. In the chamber C is a diaphragm D secured in position by a ring E and screw F. G is a globular valve whose stem is secured to the diaphragm. It has a seat H and controls the supply of gas from the chamber C to an outlet I leading to the burner or burners; and on the valve is a tapering projection J which serves as a guide for the valve. The gas to the flash light passes through holes K in a tube L past a valve M to an outlet N. The stem O of the valve is secured to the diaphragm. Leading from the supply to the burner to the supply to the flash light is a passage P into the end of which enters a regulating screw Q.

When the pressure of gas in the chamber C is small, the valve G is on its seat closing the outlet I to the burner, but the valve M falls into the position shown, allowing gas to pass to the flash light. When the pressure of gas in the chamber C increases, the diaphragm D moves upward, raising the valve G and allowing gas to pass through the outlet I to the burner. At the same time gas passes through the holes in the tube L past the valve M to the outlet N of the flash light. The flame of the flash light is lengthened by the extra supply and ignites the burner. When the pressure in the chamber C increases, the valve is lifted and closes the supply to the flash light, which is, however, supplied by gas which passes through the passage P past the screw Q.

Rotary Gas Washers and Scrubbers.—No. 162,166.

HOLMES & CO., LTD., HENSHAW, D. M., and WHITTELL, J., of Huddersfield.

No. 9432; April 1, 1920.

In apparatus of the type named it has hitherto been proposed to employ discs carrying brushes on opposite sides (back to back), which are carried round by the disc mounted on a central rotating shaft in a cylindrical casing. The discs are usually solid at the centre; and the gas, on entering the chamber, is checked and is obliged to travel through the brushes on that side of the plate to the outside of the brush ring into an annular space between the brush and the casing or through openings in the disc at this part. Thence it travels through the second brushes on the back of the former, and into the chamber in the centre of the machine again, whence it enters the next compartment through a series of apertures in the middle part of a wall or diaphragm against which rotates a brush of one disc and one of the following discs.

In such apparatus, the amount of gas which it is possible to pass through without causing excess of back-pressure is limited by the amount of free space surrounding the brush fibres. This space can only be increased (except by reducing the amount of scrubbing material) either by lengthening the brush fibre or by increasing the diameter of the washer. The latter is an expensive matter; while it has been found by experience that the former is not practicable. The present invention has for its main object, therefore, to provide a construction whereby it is possible very considerably to increase the amount of gas passed through the washer while still securing efficient washing. This is effected by splitting the gas into two streams passing through the brush rings on each side of the brush carrying discs. This doubles the capacity, without altering the length or size of the washer. The brush carrying members are formed with gas passages between the brush and the shaft; and the scrubbing partitions are formed alternately with gas passages outside the parts scrubbed by the brushes, and nearer the shaft, so as to enable the streams of gas to pass inwardly and outwardly through the brush rings.

A sectional elevation of the washer and two cross sections are given at foot of page.

The washer casing is divided into a plurality of chambers by walls or diaphragms against both sides of which rotate brushes E carried by discs F mounted on the rotating shaft G, which is supported by bearings at each end of the casing. The discs have gas ways J, and the diaphragms are alternately provided with central gas ways K, and peripheral gas ways L. The gas is admitted through the pipe M. It is split into two streams, and passes through the brushes on each side of the disc in the first chamber, whence it flows into the second chamber, and through the brushes to the periphery. Therefrom it passes through the gas ways L into the third compartment; and so on, until it reaches the sixth chamber, whence, after passing through the brushes, it leaves the casing through pipe N to re-enter the casing at O, and after treatment leaves at P.

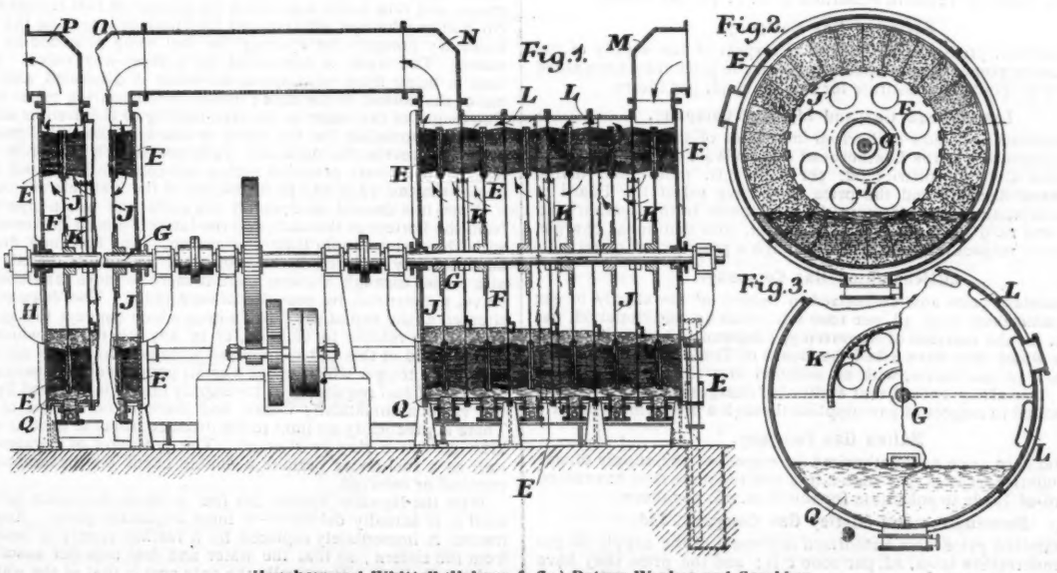
In the ordinary manner of this class of apparatus as the gas passes through, the brushes are rotated and pick-up the washing liquid from the bottom of the chamber as shown at Q.

APPLICATIONS FOR PATENTS.

[Extracted from the "Official Journal" for May 19.]

Nos. 13,087 to 13,677.

ANDERSON, W.—"Vertical retort." No. 13,223.
BALFOUR, I. T.—"Burners." No. 13,380.



Henshaw and Whittell (Holmes & Co.) Rotary Washer and Scrubber.

Beard, C. S. & P. G.—"Combined gas and water cock with pilot-jet." No. 13,247.
Boardman, F.—"Destructive distillation of coal, &c." No. 13,633.
Booer, J. R.—"Materials for purifying acetylene gas." No. 13,180.
Bowen, W. A.—"Bowls for reflected lighting." No. 13,302.
Compagnie pour la Fabrication des Compteurs et Matériel d'Usines à Gaz.—"Apparatus for lighting and extinction of gas-burners at predetermined times," No. 13,493.
Compagnie pour la Fabrication des Compteurs et Matériel d'Usines à Gaz.—"Meter for inflammable liquids." No. 13,646.
Coram, W. G.—"Self-acting valves for automatic control of flow of fluids." No. 13,590.
Cripps, F. S.—"Apparatus for evaporating paraffin, &c., and mixing the vapours produced with gas." No. 13,116.
Dale, A. G.—"Apparatus for analysis and recording of gases." No. 13,447.
District Chemical Company, Ltd.—See Booer. No. 13,180.
Greer, D.—"Combined stop and reducing valve." No. 13,358.
Honeywill Bros., Honeywill, C. & W. R.—"Apparatus for measuring liquids." No. 13,183.
King, J., & King, Taudevin, & Gregson, Ltd.—"Cooker trays." No. 13,095.
Kirke, P. St. G.—"Water-gas plants." No. 13,637.
Kirke, P. St. G.—"Combustion of fuel in steam generators, &c." No. 13,638.
Littlewood, C. W.—"Gas-flame sterilizer." No. 13,469.
Loder, W.—"Solderless connection for lead and composition pipes." No. 13,347.
Madden, H. D.—See Boardman. No. 13,633.
Meikle, J.—See Anderson. No. 13,223.
Milbourne, R. J.—See Cripps. No. 13,116.
Millet, L. C.—See Compagnie des Compteurs. No. 13 403.
Pratt, E. V.—See Bowen. No. 13,302.
Stimson, E. F.—"Geysers, gas-fires, &c." No. 13,135.
Trotter, A. M.—"Gas-compressor." No. 13,103.
Tulloch, T. G.—"Fuel, and the production of gas therefrom." No. 13,508.
West, J., & West's Gas Improvement Company, Ltd.—See Boardman. No. 13,633.
Wilton, N. & T. O.—"Manufacture of sulphate of ammonia." No. 13,261.

MISCELLANEOUS NEWS.

GAS REGULATION ACT APPLICATIONS.

The following further notices have appeared in the "London Gazette" of applications by gas undertakings to the Board of Trade for Orders under the Gas Regulation Act.

Brigg Urban District Council.

The maximum price now authorized in respect of the supply of gas by the undertakers is 6s. per 1000 c.ft.; and the price they have asked the Board of Trade to substitute for this is 1s. 7·2d. per therm.

Budleigh Salterton Gas Company, Ltd.

The maximum price now authorized in respect of the supply of gas by the undertakers is 5s. per 1000 c.ft.; and the price they have asked the Board of Trade to substitute for this is 2s. 0·2d. per therm.

Bury St. Edmund's Gas Company.

The standard price now authorized in respect of the supply of gas by the undertakers is 4s. 6d. per 1000 c.ft.; and the price they have asked the Board of Trade to substitute for this is 1s. 3d. per therm.

Eckington and Mosborough Gas Company, Ltd.

The maximum price now authorized in respect of the supply of gas by the undertakers is 5s. 6d. per 1000 c.ft.; and the price they have asked the Board of Trade to substitute is 1s. 11·7d. per therm.

Kettering Gas Company.

The standard price now authorized in respect of the supply of gas by the undertakers is 4s.per 1000 c.ft.; and the price they have asked the Board of Trade to substitute for this is 1s. 5d. per therm.

Leatherhead Gas and Lighting Company.

The standard price now authorized in respect of the supply of gas by the undertakers in the Leatherhead district is 4s. 2d. per 1000 c.ft., and in the Cobham district 6d. per 1000 c.ft. more than in the Leatherhead district; and the price they have asked the Board of Trade to substitute for this is 1s. 8d. per therm in the Leatherhead district, and 1s. 9·2d. in the Cobham district, with additional charges per therm in respect of gas supplied through a prepayment meter.

Littlehampton Gas Company.

The standard price now authorized in respect of the supply of gas by the undertakers is 4s. 3d. per 1000 c.ft., with an additional 6d. per 1000 c.ft. for the parishes of Angmering, Kingston, and Ferring; and the price which they have asked the Board of Trade to substitute for this is 1s. 8·4d. per therm, with an addition of 1·2d. for the parishes named. It is also proposed that additional charges per therm should be authorized in respect of gas supplied through a prepayment meter.

Malton Gas Company.

The standard price now authorized in respect of the supply of gas by the undertakers is 4s. per 1000 c.ft.; and the price they have asked the Board of Trade to substitute for this is 1s. 7d. per therm.

Manningtree and Mistley Gas Company, Ltd.

The standard price now authorized in respect of the supply of gas by the undertakers is 5s. 2d. per 1000 c.ft; and the price they have asked the Board of Trade to substitute for this is 2s. 4d. per therm.

Stocksbridge Gas Company.

The maximum prices now authorized in respect of the supply of gas by the undertakers are 4s. per 1000 c.ft. if coke-oven gas only is supplied, and 5s. if the undertakers themselves manufacture the gas; and the price they have asked the Board of Trade to substitute for these is 1s. per therm.

Walton-on-Thames and Weybridge Gas Company.

The maximum price now authorized in respect of the supply of gas by the undertakers is 7s. per 1000 c.ft.; and the price they have asked the Board of Trade to substitute for this is 1s. 11½d. per therm. It is also proposed that an additional charge of 2d. per therm should be authorized in respect of gas supplied through a prepayment meter.

Weston-super-Mare Gas Light Company.

The maximum price now authorized in respect of the supply of gas by the undertakers is 4s. per 1000 c.ft.; and the price they have asked the Board of Trade to substitute for this is 1s. 6·4d. per therm.

DECLARATIONS OF CALORIFIC POWER.

Brighton and Hove General Gas Company.—470 B.Th.U. (June 1).
Newport (Mon.) Gas Company.—425 B.Th.U. (May 15).
Wandsworth, Wimbledon, and Epsom District Gas Company.—470 B.Th.U. (May 16).

SPECIAL ORDER.

Bishop's Stortford, Harlow, and Epping Gas and Electricity Company.

Application has been made by the Company for a Special Order under section 10, to increase their borrowing powers, to authorize profit-sharing schemes, and to make new provisions as to meetings, directors, supplies of gas in bulk, &c.

GAS REGULATION ACT ORDER.

In the following Order, received from the Director of Gas Administration, Board of Trade, the parts applying specially to the Company, and the date of coming into operation, are noted.

Warwick Gas Company.

As from the declared date, the maximum price in respect of gas supplied by the undertakers

(*a*) Within a radius of two miles from the southern extremity of the lands first described in the first schedule to the Warwick Gas Act, 1915, shall not exceed 15·4d. per therm, and (*b*) beyond that radius shall not exceed by more than 2·4d. per therm the price for the time being charged within that radius. (May 17.)

A BENZOLE ROADSIDE SUPPLY STATION.

A new benzole roadside supply station, about four miles from Maidstone, consisting of a 6000 gallon tank and a draw-off standard on the Bywater hydraulic liquid-fuel storage system, is described at some length in the "Commercial Motor," as it is said to be one of the first, if not the first, to be devoted entirely to the storage and delivery of benzole. A few hundred feet away is a rail-siding on the main line, from which the benzole tank-wagons can supply the storage tank.

The principle of the system utilized by Messrs. Bywater and Sons, of Craven House, Kingsway, W.C., is based on the use of water power; and the method adopted when delivering the fuel is to displace the liquid in storage by water. When the fuel is exhausted, the tank is entirely filled with water; and when refilling the tank with fuel, the latter displaces a like quantity of water, which is registered through a meter, and thus keeps a record of the amount of fuel run into the tank. No pumps whatever are required for filling or emptying the tank; the necessary pressure for ejecting the fuel being provided by a head of water. The water is controlled by a three-way valve. While the tank is being filled with spirit, the water is displaced, and is forced out of the bottom of the tank through the measuring meter to a drain. The height of the water in the pipe leading to the drain is such that it is quite impossible for the spirit to leave by the same passage. In order to provide the necessary water pressure, a pipe from the main leads into a cistern provided with a ball-cock, and situated at such a height that no water can be forced out of the fuel-delivery valve.

When it is desired to draw off the spirit, the waste-pipe is shut off from the bottom of the tank, and the latter is placed in communication with the water supply from the cistern. Any fuel then drawn off is automatically replaced by an equivalent volume of water. The fuel also passes through a meter; and if there is more than one draw-off valve, a meter can be provided at each point. The draw-off valve is situated at the end of the flexible hose which conveys the spirit to the tank of the vehicle to be filled, or to any other point where it is required; and at this end is provided what is known as a nozzle-valve. This has a trigger which opens a small poppet valve releasing just the quantity of fuel required. If the supply nozzle is dropped by accident the valve automatically closes, and there is no danger of leakage. There is practically no limit to the distance from the tank at which the draw-off valves may be situated. The provision of a water-meter as well as a fuel-meter permits a double check on the amount of fuel supplied or received.

With the Bywater system the fuel is never in contact with the air until it is actually delivered—a most important point. Any fuel extracted is immediately replaced by a further supply of water drawn from the cistern; so that the water and fuel together exactly fill the tank at all times. Practically the only cost is that of the water

OUTRAGES IN THE NORTH OF ENGLAND.

Attempted Destruction of Gas and Water Mains.

Damage estimated to amount to over £50,000 was done during the past week-end in the Stockton, Jarrow, and Wallsend areas, the authors, it is alleged, being Sinn Feiners. There were a number of extensive fires; and the programme of destruction included the blowing-up of gas and water mains.

Shortly after eleven o'clock on Saturday night, there was a severe explosion at the extreme west end of South Shields, the concussion being felt for several miles. It was found that the lower of two gas-mains which are carried across the Don Bridge, between Jarrow and South Shields, and which are therefore exposed, had a hole blown in it measuring 18 in. by 13 in. A very powerful explosive must have been used in order to penetrate the thick piping. Gas escaped in volume; but fortunately a police constable was soon on the scene, and gave the alarm. The Gas Company's workmen promptly arrived, and temporarily repaired the damage.

DERBYSHIRE GAS-FUSION MOVEMENT.

A movement is on foot for the amalgamation of the Riddings and Alfreton (Derbyshire) Gas Companies.

It is stated that the Alfreton Gas Company have considerable financial difficulties; and it is felt that fusion is the best means of surmounting them. The Riddings Company have, it is understood, offered to amalgamate on the basis of 10s. for each £1 ordinary share, 7s. for the 7 p.ct. ordinary shares, and preference shares at par. For some time it is stated the Alfreton Gas Company have not met with financial success; and though the terms of amalgamation are considered low, yet the Alfreton shareholders would participate in the Riddings Company's profits.

It is reported that the Clay Cross Company have also made an offer to the Alfreton Gas Company to purchase the concern outright on the same terms as those offered by the Riddings Company, but on a cash basis. The shareholders have not yet decided what action to take.

BRIGHOUSE GAS-WORKS ACCOUNTS.

Reporting to the Brighouse Corporation Gas Committee on the working of the undertaking for the year ended March 31, Mr. C. W. Ward (the Gas Engineer and Manager) says that the quantity of gas made was 2,895,000 c.ft. less than the previous year; but the amount sold was greater by 1,018,800 c.ft., or 0·59 p.ct. Thus the unaccounted-for gas was reduced from 5·18 p.ct. to 2·4 p.ct. The average make of gas per ton of coal carbonized was 11,129 c.ft.; the quantity sold or registered by consumers' meters being 10,834 c.ft. per ton. For the past year to March the average consumption per automatic meter was 15,176 c.ft.

Residuals yielded 85 p.ct. of the total cost of coal; and after deducting this revenue from residuals, the net cost of coal was 6s. 0·87d. per ton. The wages bill totalled £12,959, as compared with £8782 a year ago. The average price received per 1000 c.ft. of gas sold was 3s. 10·53d., of which 1·37d. was net profit. The price of gas was last increased on July 1, since when considerable additional charges have been imposed upon the department. The serious slump in the value of residuals is, says Mr. Ward, likely to continue; and as there has been no corresponding reduction in the price of coal, the new financial year offers serious problems.

The total quantity of gas made in the past year was 162,450,000 c.ft.: and the net profit on the working amounts to £906.

GAS-WORKERS' WAGES AND THE COST OF LIVING.

The Directors of the Southend Gas Company and the representatives of the men have agreed to a scale of wages which will rise or fall with each movement of five points in the cost of living, though not to sink below a figure which will be substantially above that of the pre-war standard. By this agreement, two important points are realized. The first is that for the next three years all adjustments of wages in this connection will be automatic; and the second, that the men are assured of an improvement in their pay above that which they were receiving in 1914.

When the men returned to work after the recent "lightning strike" at the gas-works, one of the conditions upon which they did so was that there should be fixed by negotiation a scale regulating increases or decreases of wages in accordance with the rise or fall in the cost of living—this scale to be operative as from the end of September next. In the result, the scale set out below has been arranged without difficulty, and accepted by the Directors.

1.—That the Board of Trade index figures of cost of living be taken as a basis.

2.—That the scale be reviewable triennially at the instance of either party, on three months' notice being given.

3.—That the scale be so framed as to develop an increasing status for the men.

4.—That the index figure of 145 over pre-war rates be taken as the line for calculating increases or decreases.

5.—That for the purpose of rise or fall the index figures utilized shall be the average for the previous three months.

6.—That the adjustment be made quarterly in the week following the publication of the index figure.

7.—That only figures of five points be taken, as for instance 145 rising to 152, only five points taken; or 145 falling to 138, only five points taken; always five points or a multiple of five points above or below 145, the balance (if any) going on to next adjustment.

8.—That the base figure determining the full extent of the fall be 25s. below existing rates.

9.—That the rise or fall be 1s. per week for each five points as above defined.

Or alternatively:

10.—As between index figures 135 and 155 inclusive there shall be a neutral zone. The fall operating from 135 shall be according to this scale for every completed five points: 135, —; 130, 1s. 6d.; 125, 3s.; 120, 4s. 6d.; 115, 6s.; the rise operating from 155 shall be according to this scale for every completed five points: 155, —; 160, 1s. 6d.; 165, 3s.; 170, 4s. 6d.; 175, 6s. Below 115 points and above 175 points the rise or fall shall be according to No. 9, as above.

The working of the scheme is illustrated by taking one class of workers (the ordinary gas stoker):

	£	s.	d.
Pre-war wage	2	1	6
Present wage	4	10	0
Lowest possible wage	3	5	0

The lowest figure can be reached only after costs of living have sunk during an entire quarter of a year to 20 (or less) points over pre-war costs.

TRADE NOTES.

[For "Journal" Advertisers.]

Gas Exhausting Plant.

A new edition has been prepared by the Bryan Donkin Company, Ltd., of Chesterfield, of their booklet dealing with gas-exhausting plant, in which are to be found illustrated descriptions of their specialities and a number of photographs of actual installations. The first type of exhauster made by the firm was patented by J. Beale in 1866; and from him, in 1870, they acquired the sole right of manufacture. Later this type was displaced by an improved form patented by Beale, of which the firm also acquired the sole right of manufacture. Diagrams are given to prove, from a mechanical point of view, that the pressures and forces are better distributed in machines of the two-blade than in those of the three and four blade types. In some cases, machines are preferred having three or four blades, though it is added that the question of the number of blades has ceased to be of any importance, owing to the adoption of retort-house governors. Multiple-blade exhausters are manufactured by the Bryan Donkin Company for all capacities. The parts of the improved Beale exhauster are described, and there are diagrams showing its construction. In addition, the book furnishes particulars of governors, valves, blowers, pumps, lubricators, compressors, &c., made by the firm.

"Everok" for Retort-Benches.

The various specialities of the Torbay and Dart Paint Company, Ltd., have from time to time received favourable notice in the columns of the "JOURNAL;" but the subject is returned to now, for the purpose of drawing attention to an excellent testimonial received some while ago by the Company in connection with "Everok"—a solution for rendering the surface of existing concrete, cement, brick, stone, &c., impervious to water or the destructive action of Nature. It is manufactured on a colloidal basis, free from lime, oils, fats, or metallic soaps. The front of the retort-benches at the Ramsgate Corporation Gas-Works was coated with "Everok," for the preservation of the brickwork, and at the same time the conservation of heat; the application being made (in the absence of better means) with an ordinary hand-brush. Even with this superficial application, after nine months' continuous use, the brickwork showed absolutely no deterioration whatever. Indeed, the preservation of the brickwork was so remarkable that the engineer estimated that he had, in the period named, already saved the cost of material and labour many times over, apart from the question of economy in fuel. Even the workmen remark how nice and cool it is in front of the bench treated with "Everok." The successful experiment thus carried out at Ramsgate is one which the engineer there has confidence in recommending others to make for themselves.

British Industries Fairs.

The report has been issued of a Committee appointed by the Board of Trade to consider the best policy to be adopted in future as regards British Industries Fairs—particularly in respect of the centres at which they should be held, the trades which should be included, and the classes of exhibitors who should be allowed to participate. Evidence was heard, and a questionnaire was addressed to all associations and individuals whose views the Committee desired to obtain. It seems that the opinion of the commercial community is very largely in favour of the concentration of the fair in London. Most of those who dissented from this view considered that the existing provincial centres (Birmingham and Glasgow) should be maintained. The existing arrangement whereby the fair is held during the last week of February and the first week of March—*i.e.*, one week in advance of the Leipzig Fair—appears to be generally approved. There is a good deal to be said in favour of a second fair in the autumn; but it is clear from evidence received by the Committee that commercial opinion is not in favour of it at present. The Committee recommend that the fair should be confined to London and Birmingham, and that it should be open to all branches of British industry desiring to participate; that the fair should continue to be held, as hitherto, at such a time as will enable buyers from overseas to visit it *en route* to Leipzig and Lyons; that the holding of a second fair in the year should not be decided upon, at any rate for the present; and that, as a general rule, the fair should continue, as hitherto, to be open only to manufacturers and to wholesale firms taking the whole output of a factory or holding the sole selling rights of patented or proprietary articles manufactured in the British Empire. The importance of systematic propaganda is emphasized by the Committee.

CURRENT SALES OF GAS PRODUCTS.

The London Market for Tar, Tar Products, and Sulphate.

London, *May* 23.

Tar products are still in an uninteresting state; the market remaining very quiet. There has been some inquiry for creosote; but no definite business has been reported. Pitch for export shows growing interest; but makers' idea of price is still somewhat above that of buyers. In view of these factors, prices still remain purely nominal as last quoted—namely, creosote 9d. to 9½d. per gallon, pure benzole and pure toluol 3s. to 3s. 3d., and solvent 95-160 2s. 9d. per gallon. Deliveries for road tar are being regularly made; this being the one interesting feature. Sulphate of ammonia is without alteration.

Tar Products in the Provinces.

May 23.

The average values for gas-works products during the week were: Gas-works coal tar, 51s. 6d. to 55s. 6d. Pitch, East Coast, 62s. 6d. to 65s.: West Coast—Manchester, 60s. to 62s. 6d.; Liverpool, 60s. to 62s. 6d.; Clyde, 60s. to 62s. 6d. Benzole 90 p.ct. North, 2s. 10d. to 3s.; crude 65 p.ct. at 120° C., 2s. 3d. to 2s. 5d., naked at makers' works; 50-90 p.ct., naked, North, 2s. 11d. to 3s. 1d. Toluol, naked, North, 3s. to 3s. 1½d. nominal. Coal tar crude naphtha in bulk, North, 11½d. to 1s. Solvent naphtha, naked, North, 2s. 3d. to 2s. 4d. Heavy naphtha, North, 2s. 9d. to 3s. Creosote, in bulk, North, liquid, 8¾d. to 9¼d.; salty, 8d. to 8½d. Heavy oils, in bulk, North, 10½d. to 11½d. Carbolic acid, 60 p.ct., 1s. 8d. to 1s. 10d. Naphthalene, £20 to £30; salts, £7 to £9, bags included. Anthracene, "A" quality, 10d. to 1s. per minimum 40 p.ct.; "B" quality, nominal.

FROM A MARKET CORRESPONDENT.

Tar Products.

There has been practically nothing doing in tar products since my last report, and the position is unchanged. There is a better feeling in pitch; and it is thought that the lowest prices for the year have now been seen. The output of this article at the moment depends entirely on the gas companies; for there are no coke-ovens now in operation. As most of the gas companies are working at a very low pressure, there is practically no more pitch being produced than can be used on the roads. There is no demand for briquette making; but when the miners begin to work again, this requirement should again develop. Consequently, it is thought that the prospects for pitch are now fairly good; the latest prices are between 55s. and 65s. per ton. Carbolic acid is a dead market, and there is practically no production, as present selling prices are not profitable. Cresylic acid is also dull at about 2s. per gallon for the best quality and 1s. 10d. for second quality. Solvent naphtha is quiet, although somewhat scarce. There is very little demand, however, from the rubber manufacturing industries, and the price keeps about 2s. 3d. per gallon. Naphthalenes are in no better request; crude prices ranging from £7 10s. to £10 10s. and refined from £17 10s. to £24. Creosote is fairly firm; but the reduction in the price of American fuel oil will prevent any recovery in this material, which is now quiet at about 8½d. per gallon. There is practically no change in the position of intermediate products, except that salicylic acid is firm and inclined to advance; the latest quotation being 1s. 3d. per ton.

Sulphate of Ammonia.

The home trade is now slackening, and negotiations are proceeding between producers of sulphate of ammonia and fertilizer manufacturers with regard to prices for next season. It is understood that makers intend to establish the home price at a figure not exceeding the equivalent of the world's price for nitrogen, which will, of course, be reflected first of all in the export market. There has been more inquiry for export; and Japan has made a welcome reappearance in the market as a buyer. Spain is also showing more interest for early delivery. The export price for June-August delivery is about £16 per ton f.o.b. In America, only slight business is being done; and the price is reported to be either unchanged or slightly lower according to position. From Germany recent reports indicate a severe shortage of nitrogenous fertilizers, deliveries having been retarded owing to labour trouble. It is further reported that the German Ministry of Agriculture is of opinion that Germany's whole output of nitrogen can easily be consumed in the country. It is therefore unlikely that any exports will take place during the next twelve months. The price to German home consumers has been raised by about 20 p.ct., owing to the increase in wages and cost of production.

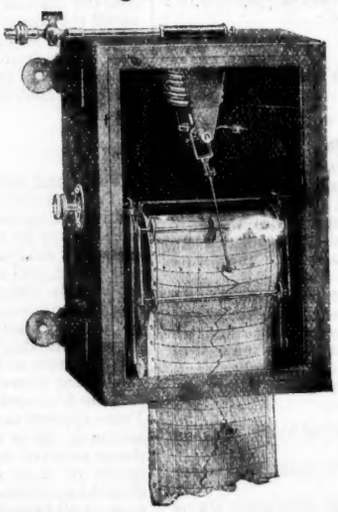
Detonator or Blasting Powder in Coal.—At about 2 p.m. last Sunday week, a slight fire occurred in the vertical retort building at the Stafford Corporation Gas-Works. Happily, however, the structural work was not injured; the only damage being that two sections of louvre boards near the chimneys, and a few roofing boards, were burnt. The apparent cause of the outbreak was a detonator, or blasting powder, going along with the coal into the retort. This blew the charge out of the vertical retort—part going into the collecting main, and another portion on to the charging floor. The safety balls and conical plugs were shot from their respective places; and the gas which was blown out with the charge ignited, and set fire to the slight accumulation of coal dust on the louvre and roofing boards. On opening the collecting main, it was found that coke dust and pieces of uncarbonized outcrop fuel had collected to a depth of 14 in. The fuel which was in the retort was obtained from the Longton area, and was mined from a depth of 12 to 24 ft. It is gratifying thus to find that the safety appliances provided as usual in installations of Glover-West vertical retorts were amply sufficient to prevent any injury to the retort-bench and the vital portions of the plant.

SIMMANCE'S DEAD BEAT RECORDER

TAPE CHART PATTERN

For Pressure or Vacuum.

NO LIQUIDS USED.



The chart roll is renewed 6 times a year.

The record can be torn off at any interval.

Lowest Range: 0-2 inches water.

Highest Range: 0-300 lbs. per sq. inch.

Suitable for Gas, Air, Water, or Steam, and may be used on Crude Gas.

MAKERS:

ALEXANDER WRIGHT & Co., Ltd., WESTMINSTER

Finances at Evesham.

Alderman Fisher (the Chairman of the Gas Committee), in moving the adoption of the minutes, at a meeting of the Evesham Town Council last Wednesday, stated that, somewhat to his surprise, a profit had been made on the year's working of the gas undertaking. The revenue account showed that the total expenditure for the year had been £27,008, and the receipts £28,491, which left a balance of £1482 gross profit. This was gratifying to the Committee, as it was not thought possible, under present working conditions, to sell gas at the price they were doing, and make a profit. Turning to the balance-sheet, he said the assets showed the total capital expenditure to be £46,458, of which, the sum of £10,338 had been taken for depreciation, thus reducing the amount standing to capital account to £36,120. Stocks in hand were £1340, and the sums due from sundry debtors £5260. The liabilities were: Loans outstanding £295, amounts due to creditors £5708, loans repaid £14,704, accumulations of profit £18,481, amount due to bankers £3531. Alderman Fisher further said it was very difficult to tell whether they would be able to maintain their good position, as there was every indication of a serious fall in the value of residuals during the present year, which would affect the revenue account. The Mayor (Alderman Geoffrey New) did not think there were many gas concerns that could show such a satisfactory state of affairs. He was sure it was due to the excellent chairmanship of Alderman Fisher, and to the skilful and energetic work of their Engineer and Manager (Mr. Percy H. Fletcher). The report was adopted.

Present Unprofitable Conditions.—The Accrington Gas Department have very limited supplies of coal, and at present can only give a restricted service of gas for a short time. The Manager (Mr. A. J. Harrison) states that the works are continuing under such conditions that it would pay them much better to close-down.

American Coal for Dundee.—When deciding upon a scheme of rationing in connection with the gas supply, the Dundee Gas Committee were informed by the Manager (Mr. A. Yuill) that an arrangement had been made for the purchase of 7453 tons of American gas coal at the price of $14 per ton—equivalent to about 70s. a ton. The coal had already left. In the circumstances, the department had no alternative but to limit supplies to stated hours until the American coal arrived.

Financial Position of the Wath Gas Board.—The newly-elected Chairman of the Wath Gas Board, Mr. Marshall Robson, at the annual meeting, said they were passing through a period of great difficulty; and it would be necessary to hold a special meeting to consider the Board's financial position. He pointed out that the Board's troubles had been complicated by the coal dispute; but the supply of gas was still adequate, and the installation of apparatus which would make for greater efficiency and economy in future was under consideration.

Glasgow Gas Curtailment.—As already announced, a scheme has had to be adopted in Glasgow, making gas available only at certain fixed hours. The following are the hours named: Week days—From 7 a.m. till 9 a.m., 12 noon till 1.30 p.m., 5 p.m. till 6 p.m., and 10 p.m. till 11 p.m. Sundays—From 8.30 till 10 a.m., 11.30 a.m. till 1.30 p.m., 5 p.m. till 6 p.m., and 10 p.m. till 11 p.m. With a view to still further conserving supplies, Mr. J. W. M'Lusky, the General Manager of the department, urged that bye-pass or pilot lights should now be entirely discarded.

Foreign Coal in the North.—The Middlesbrough Gas Committee were able last week to discharge a cargo of foreign coal which had been brought into the Tees, and, as a consequence, the town's gas supply is assured for the next few weeks. From the cargo, Middlesbrough has allotted 150 tons to Redcar, 50 tons to Gisborough, and 50 tons to Skinningrove—neighbouring localities whose gas undertakings were in dire straits. The urgent need of coal at Stockton-on-Tees has been met to some extent by a share of the cargo of coal from a ship lying in the Tyne. The export of this coal was stopped at the outbreak of the present trouble. As a result, the Gas Committee have been able to give an improved gas supply.

Housing and Cost of Gas-Mains.—The Scottish Board of Health has intimated to the local authorities that, following upon a meeting with representatives of the gas undertakings in Scotland, the Board is considering a proposal for approaching the Treasury to ascertain whether it would be prepared to sanction an agreement in which the local authority might guarantee to the gas authority a specified return of any expenditure incurred in the provision by the gas authority of gas-mains for State-assisted housing schemes, and to allow any expenditure by the local authority in implementing the guarantee to rank as part of the cost in State-assisted schemes. The "Electrical Times," in making this announcement, presumes that, if such an agreement is sanctioned, it would apply equally to electricity undertakings.

Perth (W.A.) Gas Supply.—The 1919-20 report of the City of Perth, Western Australia, states that the gas manufactured during the year was 134,746,000 c.ft., as compared with 122,954,000 c.ft. for the previous year, or an increase of 9·59 p.ct. The maximum daily output was 500,000 c.ft., as against 426,000 c.ft. last year. Coal shortage during most of the year caused much trouble. Stocks were very low several times—being down to one day's supply in August. The use of the experimental Collie coal plant greatly assisted to maintain an output and meet the heavy demand, as oil, which was formerly used in emergency, is now only procurable with difficulty at a prohibitive price. Restrictions on the use of gas were in force during February and March, owing to the coal strike. The price of coal and cost of freight have again advanced. Further wages increases representing £1500 per year came into effect on Sept. 1. In order to meet these increases it was necessary to increase the charge for gas to 7s. 11d. per 1000 c.ft. The undertaking showed a net loss for the year of £986.

ECONOMY OF COAL

This Testimonial

FROM A GAS ENGINEER

Should Convince You

DEAR SIRS, 1st *April*, 1920.

It may interest you to know the result of your suggestion that we should coat the front of our retort benches with "Everok" for the preservation of the brickwork and at the same time the conservation of heat.

I might first mention that we were unable to carry out your suggestion to apply the "Everok" by means of a spraying machine as such was not available and consequently had no alternative but to apply the "Everok" with an ordinary hand brush.

Even with this superficial application I am pleased to inform you that the brickwork shows absolutely no deterioration whatever after nine months' continuous use, although in the ordinary course of events (due to our unfortunate method of working) we should have anticipated signs of deterioration within two months. The preservation of the brickwork is so remarkable that I estimate we have already saved the cost of material and labour many times over apart from the question of economy in fuel. Even the workmen remark how nice and cool it is in front of the bench treated with "Everok."

Whilst I shall be delighted to allow any Engineer to inspect the Retort Bench in question and obtain any information he may require, I think the cost of labour and materials necessary to coat an ordinary retort bench so small compared with the remarkable results obtained that I have no hesitation in recommending every Gas Engineer to make the experiment for himself.

Yours faithfully,
Name on application.

EVEROK
THE WATERPROOFER
REGISTERED TRADE MARK

Is a colourless solution on the "NO-VOID" principle for rendering the surface of EXISTING CEMENT, CONCRETE, STUCCO, BRICK, STONE, &c., impervious to water or the destructive action of nature.

Manufactured by

THE TORBAY & DART PAINT CO., Ltd., 26, 27 & 28, Billiter St., LONDON, E C.

The Birch for a Juvenile Slot-Meter Thief.—At the Chesterfield (Derbyshire) Police Court on Friday last, a 10-year old boy was charged with stealing 9s. 1d. from a gas-meter at his mother's house. He was ordered four strokes with a birch-rod, and was warned that the next time he appeared he would in all probability be sent to an industrial school.

Leigh-on-Sea Gas-Works Finances.—It was reported by the Borough Accountant at a meeting of the Southend Corporation Gas Committee that, in order to meet the estimated loss on the undertaking for the current financial year, it would be necessary to increase the price of gas 8d. per 1000 c.ft.; and, inasmuch as the amount now charged—5s. per 1000 c.ft.—is the maximum price which the Council are permitted to charge under their statutory authority, it was resolved to recommend that application be made to the Ministry of Health for an Order authorizing the Town Council, as owners of the Leigh-on-Sea gas undertaking, to charge for gas supplied by them the sum of 5s. 8d. per 1000 c.ft.

Figures from Dukinfield.—In his report for the year ended March 31 Mr. William Lindley, the Manager of the Dukinfield Corporation Gas-Works, says the sale of gas amounted to 88¾ million c.ft., which was an increase of 1½ million c.ft. compared with the previous twelve months. The total cost of production per 1000 c.ft. of gas sold was 4s. 10·13d., as against 4s. 1·36d. for 1919-20. On the past year's working there is a gross profit of £4670, and a net profit of £41. A year ago the net profit was £1723.

Sulphate of Ammonia Plant for Glasgow.—The Glasgow Corporation Gas Committee report that a Sub-Committee have inspected the sulphate of ammonia plant at the works of Messrs. William Baird and Co., Ltd., and also at the South Metropolitan Gas Company's works in London. The Sub-Committee, after consideration of a report by the Manager on the different types of plant used in the production of neutral dry sulphate of ammonia, remitted to him to prepare and submit plans of his own designing suitable for the final treatment of sulphate of ammonia.

STOCK MARKET REPORT.

The Stock Exchange reopened on Tuesday after the Whitsun holiday in a very quiet mood, and many members were still absentees. The tone was tolerably fair; but caution was the watchword. This disinclination from enterprise, coupled in some markets with a shortage of stock, continued more or less throughout the week.

In the gilt-edged market, Home Government issues were firm generally, and War Loan had a good rise—Friday's figures for the big four were: Consols 46¾-47¼, War Loan 88 1/16-88 7/16, Funding 71⅜-71⅛, Victory 79¼-79 11/16. Bonds were not so strong; but corporations were in request. Indians were firm. Home Rails had a good week, and Canadians closed better; but Argentines were dull.

In the Foreign Market, strength was shown in French, Brazilian, Mexican, Chinese, and Japanese; and there was some lively speculation in German issues. The Norwegian loan was a fine success.

The Miscellaneous Market was mostly dull. Rubbers were quite depressed, and Oils, though not without one or two good points, were to a large extent lower. Textiles and Iron and Steel moved irregularly.

The Gas Market had a very quiet week, even making allowance for the short span of four working days. It looks as if holders are fully aware that it is a rising market, and are not inclined to part with their stock. The tone last week was excellent, and several further advances were scored. In the London Companies, Gas Light ordinary and South Metropolitan rose 1 each; and both Commercials rose 3. In Suburban and Provincial there were advances in Bournemouth, Brentford, North Middlesex, Wandsworth, Newcastle, and Sheffield. In Continentals, Imperial was quieter, and the quotation was lowered 2. European was firm. Primitivas were not much noticed.

Bargains done for cash during the week were as follows: On Tuesday, European 7⅛, Gas Light ordinary 56, ditto preference 58¾, Hong Kong, 5⅛, 5¼, Imperial Continental 147 (and exceptional 126), Primitiva preference 27s. 6d., South Metropolitan 65⅜, 66, 66¼, 67. On Wednesday, Commercial 4 p.ct. 52, Gas Light ordinary 56¼, 56½, 56⅜, ditto maximum 44⅛, ditto preference 58, 58⅜, Imperial Continental 146, 147, 147½, 148¼ (and exceptional 137½), Monte Video 63, Primitiva preference 25s., South Metropolitan 67, South Suburban 59½, 60, Wandsworth debenture 45⅛, Croydon 5 p.ct. "D" 65. On Thursday, Alliance and Dublin 41¾, Commercial 4 p.ct. 53, Gas Light ordinary 56½, 57, 57⅛, ditto preference 58¼, 58⅜, Imperial Continental 147, 147½, Primitiva 7s. 6d., ditto preference 26s. 3d., South Metropolitan 67, Reading ordinary 5 p.ct. maximum 52. On Friday, Alliance and Dublin 42⅛, Bombay 4, Brighton and Hove original 97½, 98, Gas Light ordinary 56½, 57, 57¼, ditto debenture 49½, Imperial Continental 145½, 146, 147 (and exceptional 125, 131¼, 137½), ditto debenture 79, Newcastle 59, South Metropolitan 66¼, 67, 67⅛, Reading ordinary 5 p.ct. maximum 52⅛, Woking District 7½ p.ct. debenture (1936) 100.

In the Money Market, a pretty strong demand set in almost from the opening of the week; and it was maintained at considerable pressure almost up to the close. But on Friday an accession of supplies produced a better equilibrium with demand. Discount rates moved similarly. Silver was easier, touching 33⅛d. The Bank rate is 6½ p.ct., as fixed on April 28.

ANTE-WAR PRICES AND DIVIDENDS, LATEST DIVIDENDS, AND LAST WEEK'S BARGAINS.

Issue.	Share.	When ex-Dividend.	Ante-War Dividend & Bonus.	Last Dividend.	NAME.	Closing Prices, July 30, 1914.	Present Prices.	Lowest and Highest Prices of Bargains.
£			p.c.					
182,049	Stk.	Mar. 11	4	4%	Aldershot 4 p.c. Pref.	...	53—58	...
1,551,868	,,	Apl. 14	2½	3 1/18%	Alliance & Dublin Ord.	59—64	39—44	47½—42½
374,000	,,	Jan. 13	4	4%	Do. 4 p.c. Deb.	76—79	47—52	...
280,000	5	Oct. 28	7½	8%	Bombay, Ltd.	5½—6½	4—4½	4
100,000	5	Feb. 25	16	5%	Bournemouth Gas and Water { 5 p.c.	...	7½—8½	...
383,110	10	,,	7	7%	Bournemouth Gas and Water { B 7 p.c.	15—15½	8½—9½	...
115,000	10	,,	6	6/-	Bournemouth Gas and Water { Pref. 6 p.c.	13½—14	7½—8½	...
162,065	—	Dec. 30	—	4%	Bournemouth Gas and Water { 4 p.c. Deb.	...	55—60	...
992,045	Stk.	Feb. 25	14	30/-	Brentford A Consolid.	261—266	65—70	...
734,920	,,	,,	11	26/3	Do. B New	204—209	58—63	...
55,000	,,	,,	5	5%	Do. 5 p.c. Pref.	109—111	68—73	...
221,400	,,	Dec. 15	4	4%	Do. 4 p.c. Deb.	91—93	57—59	...
214,775	,,	Mar. 11	11	7½%	Brighton & Hove Orig.	208—213	95—105	97½—98
244,200	,,	,,	8	5½%	Do. A Ord. Stk.	154—159	65—75	...
1,287,500	Stk.	July 29	5	5%	Bristol 5 p.c. max.	...	...	...
530,000	20	Mar. 30	12½	10%	British	44—45	22—24	...
120,000	Stk.	Dec. 30	4	4%	Do. 4 p.c. Deb. Stk.	88—90	50—55	...
245,771	,,	,,	4	4%	Buenos Aires 4 p.c. Deb.	85—87	37—40	...
100,000	10	May 27	—	—	Cape Town & Dis., Ltd.	1½—2½	7—7½	...
100,000	10	Apl. 28	—	4½%	Do. 4½ p.c. Pref.	4—6	4½—5½	...
100,000	Stk.	Dec. 30	4½	4½%	Do. 4½ p.c. Deb. Stk.	70—75	55—60	...
157,150	,,	Feb. 26	5	5%	Chester 5 p.c. Ord.	108—110	...	...
1,513,280	,,	Feb. 25	5/9/4	30/-	Commercial 4 p.c. Stk.	106—108	52—57	52—53
560,000	,,	,,	5½	26/3	Do. 3½ p.c. do.	103—105	50—55	...
475,000	,,	Dec. 15	3	3%	Do. 3 p.c. Deb. Stk.	69½—71½	42—45	...
800,000	,,	Dec. 11	4	—	Continental Union Ltd.	76—79	20—25	...
200,000	,,	,,	7	—	Do. 7 p.c. Pref.	115—118	30—40	...
51,600	,,	Feb. 5	15	10%	Croydon A 10 p.c.	...	120—130	...
278,400	—	,,	12	7%	Croydon B and C 7 p.c.	..	95—105	...
492,270	Stk.	—	6	4½%	Derby Con. Stk.	123—125	...	
55,000	,,	—	4	4%	Do. Deb. Stk.	102—104	...	
1,002,180	10	Jan. 29	10	5/0	European, Ltd.	17½—18	6½—7½	7½
16,298,975	Stk.	Feb. 10	4/17/4	30/-	Gas { 4 p.c. Ord.	98—102	56—58	56—57½
2,600,000	,,	,,	3½	26/3	Light { 3½ p.c. max.	76—79	42—45	44½
4,062,235	,,	,,	4	4%	and { 4 p.c. Con. Pref.	96—99	56—59	58—58⅜
4,674,850	,,	Dec. 15	3	3%	Coke { 3 p.c. Con. Deb.	72½—74½	48—51	49½
130,000	,,	Dec. 11	10	10%	10 p.c. Bonds.	...	...	...
82,500	,,	Mar. 11	5	3½%	Hastings & St. L. 5 p.c.	...	48—53	...
258,740	,,	,,	3½	2½%	Do. 3½ p.c.	87—89	34—39	...
70,000	10	May 12	11	5%†	Hongkong & China, Ltd.	16½—16¾	5—6*	5½—5½
86,600	Stk.	Mar. 11	9	5½%	Hornsey 7 p.c.	...	75—85	...
131,000	,,	Mar. 30	7½	3½%	Ilford A and C	151—154	76—81	...
65,780	,,	,,	6½	2½%	Do. B	115—118	55—60	...
65,500	,,	Dec. 30	4	4%	Do. 4 p.c. Deb.	92—94	54—56	...
1,976,000	,,	,,	9	5%†	Imperial Continental	150—160	145—150	145½—148½
1,235,000	,,	Feb. 10	3½	3½%	Do. 3½ p.c. Deb. Red.	84—86	75—80	79
235,242	,,	Mar. 30	6½	3½%	Lea Bridge Ord. 5 p.c.	119—121	62—67	...
2,498,905	,,	Feb. 26	10	37/6	Liverpool 5 p.c. Ord. { A.	211—213	...	...
						{ B. 146—148	...	...
306,083	,,	June 26	4	4%	Do. 4 p.c. Pr. Deb. Stk.	...	...	...
165,736	,,	Feb. 25	7/5/6	3½%	Maidstone 5 p.c.	...	52—57	...
75,000	5	June 11	6	3%	Malta & Mediterranean	4½—4¾	1¾—2½	...
250,000	100	Apl. 1	4½	4½%	Met. of Melbourne { 4½ p.c. Deb.	99—101	88—93	...
541,920	Stk.	Nov. 26	4	6%	Monte Video, Ltd.	11½—12	60—70	63
1,875,892	,,	Feb. 25	4½	3½%	Newcastle & Gatsh'dCon.	98½—99½	58—60	59
539,705	,,	Dec. 30	3½	3½%	Do. 3½ p.c. Deb.	82—83	50—51	...
15,000	10	Mar. 11	—	8%	North Middlesex 10 p.c.	...	12¾—13½	...
55,940	10	,,	7/14/0	5⅝%	,, ,, 7 p.c.	14—15	7½—7¾	...
300,000	Stk.	May 12	8	8%	Oriental, Ltd.	117—122	87—92*	...
60,000	5	Mar. 26	10	1/-	Ottoman, Ltd.	7¼—7¾	2—3	...
60,000	50	Feb. 25	13	7½%	Portsea Island, B	128—131	65—70	...
100,000	50	,,	12	6½%	Do. C	118—121	50—55	...
249,980	5	April 29	8	—	Primitiva Ord.	5½—6	⅞—1	7/6
499,960	5	June 26	5	—	Do. 5 p.c. Pref.	4¾—5	1¼—1½	25/—27/6
521,600	100	Dec. 1	4	4%	Do. 4 p.c. Deb.	91—93	67—69	...
600,000	Stk.	Jan. 27	4	4%	Do. ,, ,, 1911	...	37—40	...
346,198	,,	Dec. 30	4	4%	River Plate 4 p.c. Deb.	85—87	37—40	...
150,000	10	Mar. 30	6	6/-	San Paulo { 6 p.c. Pref.	10½—11	5¼—6½	...
125,000	50	Jan. 3	5	5%	San Paulo { 5 p.c. Deb.	47—49	35—40	...
135,000	Stk.	Mar. 30	10	5%	Sheffield A	223—224	62—64	...
209,984	,,	,,	10	4½%	Do. B	222—224	62—64	...
523,500	,,	,,	10	3½%	Do. C	220—222	59—61	...
133,201	Stk.	Sept. 15	4	4%	Shrewsbury 5 p.c.	...	...	...
90,000	10	Sept. 30	9	9%	South African	10½—11½	0—11	...
6,609,895	Stk.	Feb. 10	5/4/0	5%	South Met. Ord.	111—113	66—68	65½—67½
250,000	,,	Jan. 13	—	5%	Do. Red. Pref.	...	90—92	...
1,895,445	,,	,,	3	3%	Do. 3 p.c. Deb.	72½—74½	46—49	...
224,820	,,	Feb. 25	8½	7½%	South Shields Con. Stk.	157—159	85—87	...
1,087,795	,,	,,	6	3½%	S'th Suburb'n Ord. 5 p.c.	114—116	58—63	59½—60
368,837	,,	Dec. 30	5	5%	Do. 5 p.c. Deb. Stk.	116—118	72—77	...
647,740	,,	May 12	7½	3½%	Southampton Ord.	99—102	54—58*	...
121,275	,,	Dec. 30	4	4%	Do. 4 p.c. Deb. Stk.	...	57—59	...
120,000	,,	Feb. 25	—	3½%	Tottenham { A 5 p.c.	135—138	57—62	...
782,275	,,	,,	6	2½%	District { B 3½ p.c.	115—117	50—55	...
181,255	,,	Dec. 15	4	4%	District { 4 p.c. Deb.	87—89	53—56	...
182,380	10	Dec. 30	3	—	Tuscan, Ltd.	5—6	1—2	...
149,900	10	July 1	5	5%	Do. 5 p.c. Deb. Red.	93—95	45—50	...
236,476	Stk.	Feb. 25	5	3½%	Tynemouth 5 p.c. max.	108½—109	68—70	...
					Wandsworth, Wimbledon, and Epsom—			
30,000	,,	Feb. 25	8½	47/6	Wandsworth A 5 p.c.	151—156	78—83	...
255,636	,,	,,	6½	32/6	Do. B 3½ p.c.	129—134	55—60	...
108,075	,,	,,	—	33/3	Do. C	...	52—57	...
140,865	,,	,,	—	33/3	New Ordinary	...	52—57	
352,000	,,	,,	6½	26/3	Wimbledon 5 p.c.	117—122	53—56	...
98,000	,,	,,	6½	32/6	Epsom 5 p.c.	121—126	52—57	...
88,416	,,	Dec. 30	3	3%	3 p.c. Deb. Stk.	66—69	40—45	45½

* Ex Div. † Next dividend will be at this rate.

Cheap Motor Fuel.—The "Chemical Trade Journal" reports that measures are being taken by the Distillers Company, Ltd., to produce a motor fuel on a scale big enough probably to make it a serious rival to petrol. The fuel consists of a mixture of 50 p.ct. of alcohol, 25 p.ct. of benzole, and 25 p.ct. of paraffin. It is believed that the new fuel can be produced in large quantities at 2s. 8d. a gallon, which is considerably cheaper than the present price of petrol. The mileage, however, is not quite so high. A slightly higher compression is required; but its use exercises no harmful effect upon the engine.

Huddersfield Gas Surplus.—To the Huddersfield Town Council, last week, the Gas Committee reported a surplus on the year's working of the department of £285, as against a surplus of £779 in the previous year. The difficulties of the past year had occasioned consideration of an increase in the price of gas; but this had been avoided. Alderman Mitchell, in submitting the minutes, said the price was most reasonable when compared with that in other towns. The total coal consumption had been 91,000 tons, and the gas production had been close upon 1300 million c.ft.—by far the biggest production in the borough at any time. The minutes were approved.

Montevideo Gas and Dry Dock Company, Ltd.—The report to be presented to the forty-ninth ordinary general meeting of this Company to be held to-day at Dashwood House, New Broad Street, E.C., states that, after providing for interest on the debenture stock, and other charges, and including £18,296 brought forward from the previous year, the balance at the credit of profit and loss available for dividend is £52,790. An interim dividend of 3 p.ct., free of income-tax, was paid on Dec. 1 last in respect of the half year ended June 30, and the Board now recommend the payment on June 1 of a further dividend of 3 p.ct., free of income-tax, carrying forward a balance of £20,275. Compared with the previous year, the total gas sales show an increase of 7·75 p.ct.

Coal from Sewage Beds.—Coal lifted from the filter beds at the Bradford Corporation sewage works has provided fuel for the electricity and gas works during the miners' strike period. Over £20,000 worth of small coal normally lies in the beds as a filtration medium. Its appearance is not improved; but the calorific value is practically unimpaired—deterioration in a sewage bed being said to be much less than when stacked in the open air. The bulk of the 14,000 tons in the beds has now been distributed. The grease-cake plant attached to the sewage works—the Bradford sewage containing a vast percentage of grease owing to the wool trade operations—is being adapted to the making of small egg-shaped briquettes of inflammable grease and coal dust or coke dust, for placing on the industrial and domestic market during the coal shortage. Samples of the briquettes were last week submitted to a meeting of the local coal merchants.

Cape Town and District Gas Company.—At to-day's meeting, the Directors will report that, after providing interest, the result of the working for the year ended Dec. 31 last is a profit of £14,362, which with the amount brought forward makes a total of £16,098. The payment of the preference dividend absorbed £4500; £181 was written-off for depreciation of stock; and £3000 was transferred to the reserve for plant, &c., renewals—leaving a balance of £8417, out of which the Directors recommend a dividend on the ordinary shares of 6 p.ct. in respect of 1920, and to carry forward £2417. Expenses of repairs and renewals of plant have again been exceedingly heavy. It became necessary to execute repairs on two gasholders, to thoroughly overhaul the water-gas plant and reset the vertical retorts, which had been working continuously for nearly six years. Heavy increases in the cost of coal, freight, &c., necessitated raising the price of gas towards the end of the year; but the increase in price did not offset the increased expenses, and after further serious consideration the Directors decided again to raise the price from Jan. 1 last. The Directors are of opinion that the Company's business must suffer to some extent from the adverse effects of high costs and from the depression in trade which has occurred, and is continuing, in South Africa; but nevertheless progress to date is satisfactory. Considerable expenditure on capital account has been incurred during the year. The contract for additional carbonizing plant is being proceeded with as rapidly as circumstances permit. The cost of this new installation has to be provided; and the Directors have had under consideration the question of a further issue of capital. As, however, it was found possible to make temporary financial arrangements, it was considered better to defer the question until conditions became more favourable for such an issue.

Irish Gas Supply Suspensions.—Gas supplies in Limerick and Athlone have been suspended because of the coal shortage. In most Irish towns the suspension or partial suspension will be in operation this week. Industrial operations and household work are necessarily greatly interfered with.

Newtown without Gas.—The supply of gas at Newtown (Montgomeryshire) was exhausted during the morning of last Saturday week, and there was not a ton of coal in the works or any immediate prospect of a supply. The gas was cut-off for lighting purposes a fortnight earlier, and only allowed for business purposes from 7 a.m. to 7 p.m.

Restrictions at Reading Postponed.—Owing to the fact that, notwithstanding repeated appeals by the Reading Gas Company for economy, the consumption continued to be excessive, Mr. Douglas H. Helps (the Engineer and Manager) was compelled to intimate that, unless a very considerable reduction took place, it would be necessary, as from Monday, the 23rd inst., to cut-off the supply during certain hours of the day. Apparently this had some effect, for later on Mr. Helps found himself in the pleasing position of being able to postpone for the time being the taking of the measures threatened. In announcing this, he added that, "if consumers will exercise the strictest economy in the use of gas, it is hoped to avoid the necessity for restricting the hours of supply."

Traps for Road Effluents.—Referring to the case regarding damage to watercress beds at Chesham from road effluents, which was reported in the "JOURNAL" last week, Mr. A. H. Hastie, in a letter to "The Times," says: "As a result of the case, the owners of trout streams will in future have no difficulty in protecting their streams; and the road authorities will have to establish, as they easily can, grease traps or filters for the road effluents which, on much-used roads, may very easily pay for their expenses by a bye-product of grease and oil." The same suggestion was made in an article some two years ago on the "Poisoning of Fish by Road-Washings," by Mr. W. J. A. Butterfield, M.A., F.I.C., who remarked: "Broadly speaking, the droppings from motor traffic are unlikely to be mischievous directly, but indirectly they are very likely to destroy much of the insect life on which fish depend for their food supply, and to interfere with the proper aëration of the water. By suitable scum-traps, it should be possible to hold them back in pits at the road side, and so discharge the rainfall free from film into the water courses."

The Cambuslang Gas Company has now been wound-up voluntarily; the works having been taken over by the Lanark County Council.

The Cowdenbeath Gas-Works (Fife) have closed-down owing to scarcity of coal. Other works in Scotland are nearing the end of their coal supplies.

The Ministry have sanctioned a loan of £6624, repayable in fifty years, and one of £6176, repayable in twenty years, for the purpose of renewing the gas-mains in the Audley area.

Tully gas plants have been recently put to work at Abercarn, Tayport, Hindley, Altrincham, Grangemouth, Duns, Gravesend, Haslingden, and duplicate plants at Jersey and Guernsey.

Among those presented to H.R.H. the Prince of Wales on the occasion of his recent visit to Devon and Cornwall was Mr. Harold Higham, the Manager of the Teignmouth Urban District Council's Gas-Works.

The report of the Framlingham Gas Light Company for the year ended March 31 shows that the Directors are again able to recommend a dividend of 10 p.ct,, which will leave a slightly larger balance to carry forward than that which was brought into the account.

A recent issue at par of £25,000 of 7½ p.ct. redeemable debenture stock by the Winchester Water and Gas Company, of which no portion was underwritten, has been over-subscribed by the public. The stock is redeemable at par on July 1, 1931, or at the option of the Company on or after July 1, 1926, on giving six months' notice.

"Accidental death" was the verdict returned in the case of Mary Clark, aged 73, of Coventry, who was found asphyxiated in bed. A daughter said the woman was accustomed to leave a small gas-jet burning. That day the gas was turned on; but there was no light. The door and window were slightly open. The Coroner said the draught must have blown out the light.

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